Trends in employee health service : Margaret F. McKiever, editor.

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U. S. DEPARTMENT OF
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Division of Occupational Health

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Preface

In considering trends in employee health services, this publication looks both backward and forward. The past 100 years have witnessed many changes in industry, in management and labor activities, in legislation, and in the public health field of which occupational health is a vital part. The next 100 years will be even more significant. To cover the past and the future adequately, several volumes and much additional research would be required. What has been brought together here is only a résumé, which we hope will prove both interesting and useful. A number of other important items have undoubtedly been omitted, through unawareness and not through intent.

In 1950, the Division of Industrial Health (now the Division of Occupational Health) published *Industrial Health and Medical Programs* (*PHS Publication No. 15*). This reference book contained a chronological review of significant events in the field of occupational health, which has been brought up to date and is presented here in sections 1 and 2. The 100 years covered are those during which occupational and other employee health services in the United States have developed and grown along with industry.

In section 3, the developing concept of employee health is reflected in the statements of physicians, industrial hygienists, and others who directed services and influenced trends throughout the years. Most of these statements were also included in *PHS Publication No. 15*.

The future challenges of employee health services are presented in sections 4 and 5, by means of excerpts from addresses and articles by a prominent Member of Congress and two Surgeons General. These statements outline the magnitude of the task that is ahead.

In section 6, tabulations showing trends in employment, employee health, and health benefits have been brought together. The effect of all types of illness on industry and its employees, as indicated in this section, is self-evident. The tabulations show that while a great deal has been accomplished, there is more to be done. It seems appro-

priate to make a comment similar to one recently appearing in a British medical journal (*Lancet*, April 1964) that whereas an employee might be able to afford illness better now than in the past, his employer cannot afford to let him become ill. "Absenteeism has become expensive and any means of reducing it is well worth considering. That is one reason why industrial medicine has been coming into its own. As the employment of medical staff in industrial concerns looks progressively less like philanthropy and more like sound economic sense, industry is beginning to scrutinize its medical services—to ask what they are achieving and whether they could not achieve more."

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SECTION 1

Significant Events 1860–1949

Just 100 years ago our present great industrial system was young, and health and safety measures for workers in the United States were almost nonexistent.

The first paper in the United States on the problems of industrial medicine had been prepared in 1837 for the Medical Society of the State of New York. This was a prize essay *On the Influence of Trades, Professions, and Occupations in the United States in the Production of Disease* by Dr. Benjamin W. McCready, later one of the founders of Bellevue Hospital Medical College and of the New York Academy of Medicine.

The first legal action to regulate working hours in the United States had been taken by President Van Buren, in 1840, in an Executive order stipulating a 10-hour day in Government Navy Yards. Massachusetts had passed the first child-labor law in the country in 1836 and the first safety law in 1852. Louisiana had established the first State board of health in 1855. The first municipal pension fund providing disability and death benefits had been established in 1857.

The Late 19th Century

The years between 1860 and 1900 were significant for a number of reasons. Federal and State legislation, as well as private action taken by industries and industrial groups, show that interest in employee health was growing along with industrial development and urbanization.

As the century ended, the U.S. Supreme Court declared that the health of the laborer is considered to be as much a public benefit as the health of the consumer and that the protection of labor is a public purpose.

Among other significant events were the following:

1860 One of the earliest published papers on industrial toxicology was a study of mercurialism in the hatters' trade by J. Addison Freeman of Orange, N.J.

1867 Massachusetts was the first State to provide a special police officer to enforce the State law prohibiting the employment of children under 10 years of age in manufacturing establishments.

First national union to institute a benefit system was the Cigar Makers' Union. Another early national benefit program was started by the Iron Molders' Union in 1870. The benefit program of the Granite Cutters' Union, established in 1877, was the first of the national union sick benefit programs.

1868 First Federal law regarding hours of work was enacted; it stated: "Eight hours shall constitute a day's work for all laborers, workmen, and mechanics who may be employed by or on behalf of the Government of the United States." A more effective law was passed in 1892, but it did not apply to work done on a large class of goods and materials. In 1912 a law was passed requiring that an 8-hour provision be inserted in all contracts which involved employment of laborers and mechanics when made by, for, or on behalf of the Federal Government, its Territories, or the District of Columbia.

First major industrial medical care prepayment program, the hospital department of the Southern Pacific Railroad Co., was organized in Sacramento, Calif. It opened its hospital there in 1869. Other early railroad programs established during this period were the Missouri Pacific Hospital Association, established in 1872, and the Northern Pacific Beneficial Association, in 1882.

First major fraternal beneficiary society was the Ancient Order of United Workmen. This and other early fraternal organizations had as a primary purpose assistance to members when sick and when totally disabled.

1869 Massachusetts established the first State bureau of labor statistics and other States did likewise between 1872–84. These bureaus, in most cases, developed into State labor departments.

First account of the payroll checkoff for medical care of coal miners was given in a report of a trip to the Cumberland fields of western Maryland by James M'Killop of Scotland.

1874 Massachusetts was the first State to enact a law limiting the length of the working day for women without the nullifying clause exempting those under contract; the limits specified were 10 hours daily and 60 weekly. This law was further strengthened in 1879 by deleting the willful-violation requirement, thus becoming the first enforceable law regarding hours of women's employment.

1877 Massachusetts was the first State to pass a law requiring factory safeguards.

1879 A chapter entitled "Hygiene and Occupation," by Roger S. Tracy, sanitary inspector of the New York City Board of Health, appeared in *Hygiene and Public Health*, volume XIX of the Cyclopaedia of the Practice of Medicine. Other early general works were: *Diseases Incident to Some Occupations*, by Dr. J. T. Wilson, 1879–80; *School and Industrial Hygiene*, by Dr. D. F. Lincoln, 1880; *Hygiene of the Laboring Classes*, by William J. Scott, 1881; *Hygiene of Occupations*, by Dr. George H. Rohe, 1884; and *The Preventable Causes of Disease, Injury, and Death in American Manufacture and Workshops and the Best Means for Preventing and Avoiding Them*, by Dr. J. H. Ireland, 1886.

1880 Massachusetts enacted a law stipulating that printed notices containing the daily hours of work should be posted in a conspicuous place in every room where employees coming under the 10-hour law were at work. Two amendments in 1886 and 1887 provided that the notices must be put on forms approved by the attorney general and supplied by the enforcing authority, and must contain the hours of beginning and ending work and of meal times, as well as the number of hours worked each day.

Federal census included a question as to the number of persons sick and unable to work on the day of the census. This was probably the first time home interviews were used to collect data on sickness from all causes in the United States.

1882 First major employee-sponsored mutual benefit association was the Northern Pacific Railway Beneficial Association, which developed a program of complete medical care and other benefits financed by employer-employee payments. Medical services were provided through group practice in the Northern Pacific Hospital in St. Paul, Minn., and through arrangements with physicians along the line. In 1885 the Macy Mutual Aid Association was established, which in 1886 appointed a part-time physician to advise on sick-benefit claims and give service for minor ailments.

1884 Bureau of Labor was created in the U.S. Department of the Interior; in 1888 it became an independent Department of Labor without executive rank. In 1903 Congress created the Department of Commerce and Labor, and in 1913 the U.S. Department of Labor.

The first so-called "plant surgeon" of record was Dr. William J. Middleton, who was appointed surgeon for the Pennsylvania Steel Co., Shelton, Pa.

1885 Alabama enacted the first employers' liability law, followed by Massachusetts in 1887.

1886 Massachusetts was the first State to place an accident-reporting law upon its statute books.

1887 Homestake Mining Co. of Lead, S. Dak., established a company-financed medical department with full-time staff providing complete medical service to employees and their families.

1888 American Association of Railroad Surgeons was founded.

1890 Massachusetts enacted the first State law prohibiting employment of women after 10 p.m.

First industry with a dental program was the Barber Match Co. Another pioneer in this field was the Armstrong Cork Co.

1893 California passed the first law requiring a weekly day of rest for women workers.

1895 Vermont Marble Co., of Proctor, Vt., was the first company in the United States to hire a nurse, Ada Mayo Stewart, to guard the health of an employed group, followed in 1897 by the Benefit Association of the John Wanamaker Co. of New York; in 1899 by the Brooklyn department store of Frederick Loeser; in 1900 by the Emporium in San Francisco; in 1901 by the Plymouth Cordage Co. in Massachusetts and the Anaconda Mining Co. in Montana; in 1902 by the Chase Metal Works of Connecticut and the Broadway Store in Los Angeles.

1897 Dr. Andrew Magee Harvey, chief surgeon of the Crane Co., Chicago, provided safety glasses for operations in that plant.

1898 U.S. Supreme Court made the first broad statement that the health of the laborer as a producer is considered to be as much a public benefit as the health of the consumer and that the protection of labor becomes a public purpose.

The Early 20th Century: 1900–1914

Interest in the health and safety of workers continued to grow during the early 1900's. The pioneer legislation enacted and the health and safety programs established during the preceding years served as patterns for similar activities in various parts of the country. New action was also taken. At the midpoint (1913) of the last 100 years (1865–1965), a U.S. Department of Labor was established. An Office of Industrial Hygiene and Sanitation in the U.S. Public Health Service was established in 1914.

1902 First official industrial hygiene survey in the United States was made for the Department of Labor by Dr. C. F. L. Doehring, a former student of Dr. George M. Kober.

Connecticut enacted a law requiring the absence of contagious disease in workers in bake shops.

Maryland passed the first legislation providing for stated benefits to workmen injured in the course of employment without suit or proof of negligence in the form of a cooperative insurance law. Law was declared unconstitutional by a Baltimore court in 1904.

1903 Illinois enacted an 8-hour day for children under 16. This standard existed in 23 jurisdictions by 1915.

1904 National Child Labor Committee was formed to act as a clearinghouse of information on child labor, to investigate conditions, to educate public opinion, and to promote legislation. It was incorporated by an act of Congress in 1906.

1905 Massachusetts State Board of Health issued a brief report on the conditions affecting the health and safety of employees in factories and other establishments in the State. This report was supplemented in 1907 by an extensive study of dusty trades made by Dr. William C. Hanson. The 90 photographs from this study, together with charts and a collection of dust and other materials, were put on display in Boston—the first industrial hygiene exhibit in the country.

First instruction in industrial hygiene was given in the Department of Biology and Public Health of the Massachusetts Institute of Technology by Dr. C-E. A. Winslow. In 1906 the Medical Department of the University of Pennsylvania, in connection with its courses leading to a doctorate in public health, placed considerable emphasis upon industrial hygiene, including inspection of industrial plants, service in first-aid

stations and emergency hospitals in some of the larger plants, and in the occupational disease clinic of the University Hospital.

1906 American Association of Labor Legislation was organized with John B. Andrews as secretary, to conduct investigations, hold national conferences, publish reports, draft bills, and secure the enactment into law of progressive standards. First Federal law relating to compensation for injuries sustained in the course of employment in interstate commerce was enacted for railroad workers, but was declared unconstitutional in 1908; a revised law was enacted and declared constitutional in 1912.

Massachusetts passed the first State law requiring a physical examination of all children applying for employment certificates.

One of the first recorded examples of giving physical examinations to a group of workers was done by Dr. Frank T. Fulton, of Providence, R.I., in a large saw works for the purpose of finding tuberculosis. For the same reason Dr. Harry Mock instituted the examination of employees of Sears, Roebuck & Co. of Chicago in 1909.

1907 Hours of Service Act was approved by the President, limiting service of train employees and telegraph and signal operators.

1908 Congress enacted a law granting to certain employees of the United States the right of compensation for injuries sustained in the course of employment; in 1916 Congress replaced this act with one covering all Federal civilian employees.

U.S. Supreme Court settled the question of restricting hours of work for women when it upheld the constitutionality of the Oregon 10-hour law as a health measure.

State of Illinois appointed a Commission on Occupational Disease; Dr. Alice Hamilton did the investigations of lead poisoning; Dr. Emery R. Hayhurst, copper; and Dr. Peter Bassoe, caisson sickness. The final report was published in 1911.

As Chairman of the Committee on Social and Industrial Betterment of the President's Homes Commission, Dr. George M. Kober submitted a *Report on Industrial and Personal Hygiene.* Census mortality reports contained the first useful tables, including essential facts for selected groups of occupations.

Mortality From Consumption in the Dusty Trades by Frederick L. Hoffman was published by the Bureau of Labor.

1909 First White House Conference on Child Labor was held. Montana passed a law providing for a State cooperative insur-

ance fund for workers in and around coal mines which was declared unconstitutional in 1911.

New York was the first State to pass a law specifying that applicants for work in compressed air must be found physically qualified by a physician paid by the employer; a similar law was enacted in New Jersey in 1914.

Milwaukee Visiting Nurse Association placed the first nurse in a local industrial plant to demonstrate to the employer the economic value of a public health nursing service.

Metropolitan Life Insurance Co., at the suggestion of Lillian Wald, began using Henry Street visiting nurses in an experiment in home nursing as a service to holders of industrial policies in a section of Manhattan.

1910 New York Employers' Liability Commission reported its findings to the legislature as a result of which two types of workmen's compensation laws were enacted, one voluntary and one compulsory. The compulsory law was the first that was broad enough in scope to be truly effective, but there was no requirement as to insurance of the compensation risk. The statute was held invalid by the New York Court of Appeals in 1911 in *Ives* v. *South Buffalo Railway Company*. An amendment to the constitution made possible the enactment of a compulsory law in 1914.

Department of Labor issued a report on *Phosphorus Poisoning in the Match Industry in the United States* by John B. Andrews. This led to the first major public act to control occupational disease in the United States—the imposition of a prohibitive Federal tax on yellow (white) phosphorus matches. Dr. Alice Hamilton was requested by the U.S. Commissioner of Labor to investigate the lead industry throughout the country. Her report (Bureau of Labor Bulletin No. 95) was published in 1911. She continued making studies of industrial poisons for the Federal labor agency until 1921.

U.S. Bureau of Mines was created in the Department of the Interior.

First national conference on industrial diseases was held under the sponsorship of the American Association for Labor Legislation.

First occupational disease clinic in the United States was started at the Cornell Medical School Outpatient Department in New York City by Dr. W. Gilman Thompson; it was discontinued in 1916.

1910 At the First National Conference on Industrial Diseases, Frederick L. Hoffman of the Prudential Life Insurance Co. of America estimated that 280 million days were lost in industry from accidents and illness. The report, based on meager statistics, indicated that the average loss exceeded 8 days per employee.

Cornell University, in connection with its medical school in New York City, established an outpatient clinic that provided facilities for the study and treatment of occupational diseases. It was discontinued in 1916.

1911 Illinois passed a law requiring monthly examinations of workers in industries using or processing lead, zinc, arsenic, brass, mercury, and phosphorus, but did not require the removal from danger of workmen who showed symptoms of the resultant diseases. Missouri enacted a similar law in 1913.

Washington was the first State to adopt a compulsory workmen's compensation law in the face of the *Ives* decision. The Washington act created a State insurance fund which was liable for compensation payments and maintained by compulsory contributions from employers. New Jersey was the first State to adopt the elective type of workmen's compensation law, with certain penalties attached for nonelection. Eight other States also enacted workmen's compensation laws in 1911—California, Nevada, Ohio, Illinois, Wisconsin, Kansas, Massachusetts, and New Hampshire.

Second occupational disease clinic in the United States was started at the Sprague Memorial Institute of the University of Chicago and the Rush Medical College by Dr. Emery R. Hayhurst.

Massachusetts was the first State to forbid the industrial employment of women within 2 weeks before or 4 weeks after childbirth; New York followed in 1912 and Connecticut and Vermont in 1913.

First American law for compulsory reporting of occupational diseases was drafted by the American Association for Labor Legislation and enacted in California in March. Similar laws were passed by Connecticut, Illinois, Michigan, New York, and Wisconsin.

Massachusetts enacted a law intended to protect textile mill operatives from tuberculosis by preventing the use of any form of shuttle in the use of which any part of the shuttle or any thread is put in the mouth or touched by the lips of the operator.

Triangle Waist Co. fire in New York City led to the establishment of the New York Factory Investigating Commission which appointed Dr. George Price to direct its studies of health and safety problems.

Montgomery Ward purchased the first group life insurance contract from the Equitable Life Assurance Society.

First psychological tests for the selection of streetcar motormen were conducted by Prof. Hugo Munsterberg of Harvard on the Boston Elevated Railway employees.

American Museum of Safety, later to be known as Safety Institute of America, was established in New York City; it had a Department of Industrial Hygiene.

1912 Massachusetts courts deemed the phraseology of the workmen's compensation act sufficiently broad to embrace diseases growing out of employment.

An International Congress on Hygiene and Demography was held in Washington, D.C., with a large section devoted to industrial hygiene.

Louisiana established the first division of child hygiene in a State department of health.

U.S. Children's Bureau was established to investigate and report on all matters pertaining to the welfare of children and child life.

Fatigue and Efficiency: A Study in Industry by Josephine Goldmark was published.

1913 First State industrial hygiene agencies were established in New York and Ohio, staffed with physicians and engineers.

Ohio and Pennsylvania "lead laws" required monthly examinations of workers employed in the manufacture of certain of the more poisonous lead salts; a physician who discovered a case of lead poisoning was required to report it to the State department of labor and of health and also to the employer, who after 5 days must not continue the "leaded" employee in a dangerous process nor return him thereto without a physician's written permit.

National Council for Industrial Safety, name changed to National Safety Council in 1915, was organized to collect information on accidents both within and without industry and to promote accident prevention programs. A health service section was established in 1914.

First union-sponsored service type of medical care plan was started by the International Ladies' Garment Workers' Union as a result of studies by the Joint Board of Sanitary Control in the Cloak, Suit and Shirt, and Dress and Shirt Waist Industries of Greater New York. In 1917 the Union Health Center was incorporated.

First registry for industrial nurses was opened in Boston for the purpose of supplying suitable nurses for the emergency rooms of factories.

First statewide survey of industrial hygiene problems was begun in Ohio by Dr. Emery R. Hayhurst for the Ohio State Board of Health. His report *Industrial Health Hazards and Occupational Diseases in Ohio* was published in 1915.

Health activities of the U.S. Bureau of Mines were begun with the loan of Dr. S. C. Hotchkiss from the U.S. Public Health Service for special studies. Dr. A. J. Lanza, also from the Service, was Chief Surgeon from 1913 to 1920. The Bureau formalized its health work in 1920 with Dr. R. R. Sayers in charge. In 1926 a Safety and Health Branch was created, with Dr. Sayers continuing as its first Chief.

1914 Office of Industrial Hygiene and Sanitation was established in the Division of Scientific Research of the U.S. Public Health Service.

Section on Industrial Hygiene was organized in American Public Health Association as its fifth section.

First U.S. Public Health Service studies of industrial hygiene problems were made. Pulmonary diseases in miners in Joplin, Mo. (the Tri-State District), were studied by Dr. A. J. Lanza and Edwin Higgins of the U.S. Bureau of Mines. Group chest X-rays were used for the first time in this study. An extensive followup study was made at a special clinic in Picher, Okla., in 1927 sponsored by the same Federal agencies and the Metropolitan Life Insurance Co. and Tri-State Mine Operators. Another early U.S. Public Health Service study was made of the health of garment workers in New York City by Dr. J. W. Schereschewsky at the request and with the cooperation of the Joint Board of Sanitary Control (Public Health Bulletin No. 71).

Conference Board of Physicians in Industry was established as the medical advisory committee to the National Industrial Conference Board.

Office of Industrial Hygiene and Sanitation of the U.S. Public Health Service began to receive periodic reports from about 250 industrial sick benefit associations on the number of cases and number of days of disability among plant population. The first reports based on this data, written by Dean K. Brundage and Bernard J. Newman, were issued in 1919 and 1920.

First modern American texts in the field were published: *The Occupational Diseases* by Dr. W. G. Thompson; *The Modern Factory* by Dr. George M. Price. Other early texts were: *Diseases of Occupation and Vocational Hygiene* edited by Drs. George M. Kober and William C. Hanson, 1916, and *Industrial Medicine and Surgery* by Dr. Harry E. Mock, 1919.

1915 U.S. Supreme Court upheld the constitutionality of California law which fixed an 8-hour day as the maximum for women workers.

First scientific symposium on industrial hygiene and medicine was held at the annual meeting of the American Medical Association.

American Association of Industrial Physicians & Surgeons was organized to raise the standards of industrial medical practice (*see* appendix).

U.S. (Walsh) Commission on Industrial Relations issued its 11-volume report on its investigation of industrial unrest and labor-management relations. This included a survey of the sickness prevalent among approximately a million workers of representative occupations.

A clinic for the study of occupational disease was established at the Ohio State College of Medicine. Other schools soon followed suit.

The Years Prior to World War II: 1915–41

Much of the activity in this period followed patterns established in earlier years. Additional States enacted workmen's compensation and other legislation relating to employee health and safety. State hygiene agencies were established. More industries employed physicians and nurses to give care at the workplace, primarily for industrial injuries. Studies by public and private organizations continued, in an effort to detect and eradicate occupational health hazards.

A limited number of employees were now eligible for medical care and/or financial assistance during nonoccupational illness through the programs established by their employers or by employee groups. Two

events in the 1920's were destined to have far-reaching effects upon this type of employee health service: (1) the signing of the first collective-bargaining agreement with a health and welfare clause, and (2) the beginning of the first nonprofit prepayment group hospital plans.

1916 Child Labor Act was approved but was declared unconstitutional in 1918; the second act passed in 1919 was declared unconstitutional in 1922.

1917 U.S. Supreme Court held that both compulsory and elective types of State workmen's compensation statutes are valid.

Hawaii was the first jurisdiction of the United States to enact occupational disease compensation legislation, followed by California in 1918, and Connecticut and Wisconsin in 1919.

College of Business Administration of Boston University offered the first course in the country designated particularly for industrial nurses.

Vocational Education (Smith-Hughes) Act became effective, followed by the Vocational Rehabilitation Act in 1918.

Working Conditions Service of the Department of Labor was established as a cooperative activity with the U.S. Public Health Service Office of Industrial Hygiene and Sanitation.

Causes of Death by Occupation by Louis I. Dublin was published by the Bureau of Labor Statistics: it analyzed the occupational mortality experience of the Metropolitan Life Insurance Co. for the 3 years 1911–13.

At the American Society of Mechanical Engineers, Dr. Otto Geier stated: ". . . the average worker receives his first complete physical examination in the industrial clinic. He is too often the victim of blind gunshot prescriptions. The industrial clinic is teaching him to seek a better type of physician for himself and his family, and in that sense the industrial physician is tending to raise the standard of private practice on the outside."

1918 Harvard University was the first institution to establish a course of instruction and research leading to degrees in industrial hygiene. This included work in the occupational disease clinic at the Massachusetts General Hospital for students with a medical degree. In 1919 the Medical School of the University of Cincinnati established a 1-year course leading to a certificate of public health in industrial medicine. Yale and Johns Hopkins

also provided courses in industrial health to graduate public health students at this time.

Saranac Laboratories of the Trudeau Foundation began its extensive studies on tuberculosis and lung diseases under Dr. L. U. Gardner.

1919 First professional periodical dealing with the field of industrial health was the *Journal of Industrial Hygiene*, which in 1936 changed its name to the *Journal of Industrial Hygiene & Toxicology*.

Two of the earliest nationwide surveys of medical and surgical services in industrial establishments were published. One was made by Dr. C. D. Selby of the U.S. Public Health Service (Public Health Bulletin No. 99) and the other by the Bureau of Labor Statistics, U.S. Department of Labor (Bureau of Labor Statistics Bulletin No. 250).

Industrial Nursing by Florence Swift Wright, first book written especially for nurses in industry, was published. A chapter entitled "Nurse in Industry" by Mae Middleton, an industrial nurse of Chicago, appeared in Mock's *Industrial Medicine and Surgery*.

New Jersey established six rehabilitation clinics for industrial workers; those in Newark and Jersey City were under the direction of Dr. H. H. Kessler.

1920 Civil Service Retirement and Disability Fund was established for Federal employees.

National Organization of Public Health Nurses established an industrial nursing section (*see* appendix).

First temporary disability benefits for nonoccupational accident or sickness were provided under group contracts from private insurance companies.

Women's Bureau was established in the U.S. Department of Labor to study the health and welfare of women in industry.

1921 Sheppard-Towner Act was passed; it provided Federal grants to States to promote maternal and infant welfare and hygiene.

Occupation Hazards and Diagnostic Signs by Louis I. Dublin and Philip Loiboff was published by the Bureau of Labor Statistics; because of its great usefulness as a ready reference, it was revised several times.

Safety Code for Lighting of Factories, Mills and Work Places, sponsored by the Illuminating Engineering Society, and Safety

Code for the Protection of Industrial Workers in Foundries, sponsored by the National Foundrymen's Association, were issued by the American Standards Association. Safety Code for the Protection of Head and Eyes of Workers was published by the U.S. Bureau of Standards; the following year it was revised and issued by the American Standards Association. Protection of respiratory organs was added in 1938.

1924 Following 18 to 20 deaths among the watch dial painters in New Jersey, extensive studies into the health hazards of the radium watch dial industry were made, including one by the U.S. Public Health Service which outlined the methods of control.

1925 First American text on industrial toxicology, *Industrial Poisons in the United States*, was written by Dr. Alice Hamilton.

Surgeon General, U.S. Public Health Service, upon the completion of studies by the Bureau of Mines, several universities, and the oil industry, held a conference on the health aspects of the manufacture, distribution, and use of tetraethyl lead gasoline (Public Health Bulletin No. 158). As a result, the U.S. Public Health Service investigated the hazard and drafted a set of suggested recommendations for adoption by the States.

1926 American College of Surgeons appointed its Committee on Industrial Medicine and Traumatic Surgery and later adopted the Minimum Standard for Medical Service in Industry.

National Safety Council's Committee on Benzol, C.-E. A. Winslow, chairman, published its final report of studies done by Dr. Leonard A. Greenburg and associates of the U.S. Public Health Service.

First collective-bargaining agreement with a health and welfare clause was between the Public Service Corp. of Newburgh, N.Y., and the Amalgamated Association of Street & Electric Railway Employees. It provided for life insurance and weekly sick benefits.

First citywide survey of industrial hygiene problems was begun in Nashville, Tenn., in connection with a public health survey conducted jointly by the city health department, the State health department, the U.S. Public Health Service, and the Metropolitan Life Insurance Co.

1927 Harvard University initiated a graduate program in industrial hygiene, probably the first such graduate program in the United States and perhaps the world.

1929 Forerunner of Blue Cross hospital plans was a contract made between schoolteachers in Dallas, Tex., and Baylor University Hospital. In 1933 the American Hospital Association endorsed the principle of group prepayment for hospital bills and established a list of essentials which should characterize such plans. In 1934 the American College of Surgeons gave its approval to prepayment plans for medical and hospital service.

Psychiatry in Industry by Dr. V. V. Anderson was the report of a 4-year study of the mental health problems of the employees of the R. H. Macy & Co., New York, conducted by a psychiatric team employed by the company.

1933 National Industrial Recovery Act's industrial codes of fair competition included regulations on hours and on safe and healthful working conditions; they were declared unconstitutional in May 1935.

Committee on the Costs of Medical Care issued its final reports based on a 5-year study of all types of medical services; 4 of the 28 reports dealt with industrial prepayment medical-care plans.

1934 Division of Labor Standards was established in the U.S. Department of Labor; it was changed to the Bureau of Labor Standards in 1948.

First National Conference on Labor Legislation was held under the sponsorship of the U.S. Department of Labor to obtain closer Federal-State cooperation.

Insurance against the costs of hospitalization was first offered by private insurance companies; group surgical expense insurance was started in 1938, and group medical expense insurance in 1943.

1935 Social Security Act was passed making, among other provisions, Federal funds available to U.S. Public Health Service for extending research investigations and for making grants-in-aids to the States for public-health work including industrial hygiene. This stimulated the development of State industrial hygiene units.

Safety Code for Industrial Sanitation in Manufacturing Establishments, sponsored by the U.S. Public Health Service, was

issued by the American Standards Association. First major study of *Anthraco-Silicosis Among Hard Coal Miners* was made in Pennsylvania by the U.S. Public Health Service at the request of the Governor and with the joint support of the anthracite coal operators and the United Mine Workers of America.

1936 Congress passed the Public Contracts Act (Walsh-Healey) which established labor standards on Government contracts; these included requirements for the safety and health of workers.

National Silicosis Conference was called by the Secretary of Labor to discuss the silicosis problem from the viewpoint of the medical man, of the employer, and of the employee. Four committees were appointed: the Committee on the Prevention of Silicosis Through Medical Control; the Committee on the Prevention of Silicosis Through Engineering Control; the Committee on the Economic, Legal, and Insurance Phases of the Silicosis Problem; and the Committee on the Regulatory and Administrative Phases of the Silicosis Problem. The final committee reports were published in 1938.

Air Hygiene Foundation, which later changed its name to Industrial Hygiene Foundation, was organized by some of the largest industrial concerns in the country, the U.S. Public Health Service, U.S. Bureau of Mines, and the Mellon Institute (*see* appendix).

Seminars were initiated by the Office of Industrial Hygiene and Sanitation, U.S. Public Health Service, to train official personnel to implement the grant-in-aid program under the Social Security Act.

U.S. Public Health Service published a report on the nature and incidence of air pollution in 14 of the largest cities in the country (Public Health Bulletin No. 244).

1937 American Medical Association created the Council on Industrial Health to coordinate all medical efforts in the industrial health field (*see* appendix). In 1939 the council sponsored its first Annual Congress on Industrial Health.

Industrial Hygiene was established as a division of the National Institutes of Health, U.S. Public Health Service, to supersede the Office of Industrial Hygiene and Sanitation.

Railroad Retirement Act, which included provisions for sickness and maternity benefits, was passed.

1938 American Conference of Governmental Industrial Hygienists was organized to promote sound administration of governmental industrial hygiene activities (*see* appendix).

Federal Fair Labor Standards Act was passed; it extended the principals of maximum hours and minimum wages to all workers in industries engaged in interstate commerce.

1939 Indiana State Health Department was the first to employ an industrial nursing consultant, followed by Michigan in 1940.

American Industrial Hygiene Association was organized to provide a means for exchanging and increasing knowledge of industrial hygiene (*see* appendix).

In California and Michigan the first statewide prepayment medical care plans sponsored by State medical societies were organized; California Physicians' Service began operations in this same year, but Michigan Medical Service did not offer contracts until 1940.

1940 National Defense Council, with approval of the President, designated the Federal Security Administrator as coordinator of all health, medical welfare, nutrition, recreation, and related fields of activity affecting the national defense.

First comprehensive report on the industrial hygiene problems of the Nation based on surveys made in the States under the guidance of J. J. Bloomfield of the Division of Industrial Hygiene, U.S. Public Health Service, was issued (Public Health Bulletin No. 259).

1941 A conference of the industries processing hatters' fur, the labor union, the State health officials, held in Connecticut at the request of the Surgeon General of the U.S. Public Service, reached an agreement to use only nonmercurial compounds in the felt-carroting industry.

Federal Mine Inspection Act was passed, authorizing the U.S. Bureau of Mines to inspect coal mines and make investigations and recommendations relating to health and safety conditions.

First institute for State industrial nursing consultants was held at the National Institutes of Health under the auspices of the Industrial Hygiene Division of the U.S. Public Health Service.

The World War II Years and Those Immediately Following: 1942–49

Previous accomplishments in the fields of occupational health and medical care for employees contributed greatly to the war effort. Absence studies made prior to and during the war years focused atten-

tion on the fact that nonoccupational illness was causing about nine-tenths of all sick absence in industry. The importance of full production and of protecting the health of all workers, particularly the large number of women entering the labor force for the first time, focused interest on health maintenance. The scope of in-plant health programs began to increase, and health and welfare benefits in collective bargaining became an established procedure.

1942 Rhode Island enacted the first State law providing cash sickness benefits to workers for nonoccupational illness and injury covered by its unemployment insurance law. Payments began in April 1943.

War Manpower Commission, with the Federal Security Administrator as Chairman, was created by the President. The U.S. Employment Service, National Youth Administration, apprenticeship training service, and training-within-industry service was transferred to the War Manpower Commission by Executive order, thus consolidating all authority over employment and employment training within the Commission.

American Association of Industrial Nurses was formed to improve the standards of nursing practice in industry (*see* appendix).

U.S. Army and Navy established occupational health services for the civilian employees in plants and shipyards owned and operated by the armed services.

1943 Present structure of the U.S. Public Health Service was defined and in the following year all laws relating to the U.S. Public Health Service were consolidated.

First medical benefits, other than weekly sick benefits, provided under a collective-bargaining agreement, became effective for members of the Philadelphia Waist and Dress Joint Board of the International Ladies' Garment Workers' Union.

American Association of Industrial Dentists was founded to promote and improve industrial dental programs.

National Safety Council organized its own industrial nursing section (from 1930–43, NOPHN's section on industrial nursing filled this role).

Federal grants to State health departments were authorized for emergency maternity and infant care for wives and infants of enlisted men in specified grades of the Armed Forces; administrative responsibility for the program was carried by the Children's Bureau.

1946 California was the second State to enact a law for cash sickness benefits for nonoccupational illness and injury to workers covered by the State unemployment insurance law. Payments began in December 1946.

Congress enacted Public Law 658, the Federal Employees Health Service Act, which authorized Federal departments and agencies to provide their employees with health-service programs limited to treatment of on-the-job illness, preemployment examinations, and preventive health programs.

The Academy of Occupational Medicine was founded by physicians devoting full time to the teaching or practice of occupational medicine.

The United Mine Workers of America set up the first big health-welfare fund in industry in the United States. The fund was financed by the coal operators with per-ton payments, and the first medical services under the program were given to paraplegic employees.

1948 National Labor Relations Board ruled that pension, health, and welfare plans were within the scope of collective bargaining. These rulings were sustained by the action of the higher courts in 1949.

Workmen's compensation legislation became nationwide with Mississippi's enactment of such a law.

New Jersey was the third State to enact a law for cash sickness benefits for nonoccupational illness and injury to workers covered by the State unemployment insurance law. Payments began in January 1949.

The Federal Government's first national conference on industrial safety met in Washington, D.C.

1949 First major study in the United States of the effects of air pollution on health was made by U.S. Public Health Service in Donora, Pa. (Public Health Bulletin No. 306).

New York was the fourth State to enact a law for cash sickness benefits for nonoccupational illness and injury to employed workers. Payments began in July 1950.

Presidential Board of Inquiry into the labor dispute in the basic steel industry concluded that social insurance and pensions should be considered a part of normal business costs to take care of temporary and permanent depreciation in the human "machine."

SECTION 2

Developments in Recent Years

During and after the war years American technology grew by leaps and bounds. New industrial processes and chemicals and increasing automation have rapidly changed the work environment. As a result of what had already been accomplished in the occupational health fields, many of the classical occupational diseases had been eradicated or controlled; but new problems were arising with results that could be more far reaching than those of the past and more difficult to detect. The well-known occupational diseases, too, continued to appear, though in smaller numbers. Industrial specialists began to look toward the future and to encourage preventive health and other health maintenance services. The health problems and work potentialities of physically handicapped workers also began to receive special attention.

So much has happened in recent years that it is impossible to report all significant events. The items included here are but a partial record and are limited principally to some of the more important legislation and actions of national significance.

1950 First Technical Conference on Air Pollution was held under the auspices of several Federal agencies, including the U.S. Public Health Service and the U.S. Bureau of Mines.

For the first time in the history of American industrial institutions, the degree of Doctor of Industrial Medicine was conferred upon medical graduates. The degree was conferred at the University of Pittsburgh on three recipients who had completed a special industrial course.

American Medical Association's Council on Medical Education and Hospitals approved the establishment of residencies in occupational health at the Saginaw (Mich.) General Hospital.

Sixteenth National Conference on Labor Legislation recommended an overall Federal temporary disability law, and stated that if federalization of disability insurance were not feasible immediately, the States should adopt disability insurance laws.

National Conference on Workmen's Compensation and Rehabilitation met in Washington, D.C., to consider ways of facilitating the rehabilitation of injured workers.

Reports showed that 43 States, the District of Columbia, and 11 cities had established industrial hygiene programs. Governmental agencies (Federal, State, and local) had a total of 469 full-time professionals responsible for providing services, including 47 physicians, 46 nurses, 336 engineers and chemists, and 40 others. Almost 11,000 nurses were employed full time in industry and over 2,000 physicians were specializing full or part time in occupational health.

Survey by the New York State Department of Labor revealed that 19 out of 20 establishments employing 5,000 or more workers had extensive occupational health programs in operation, manned by regular in-plant personnel. However, only 1 out of every 20 establishments employing between 100 and 200 workers had set up such programs. Other surveys in the early 1950's also showed a lack of health services in small plants. Estimates indicated that at least two-thirds of the workers in nonagricultural establishments did not have health services available at the workplace.

Division of Industrial Hygiene, U.S. Public Health Service, set up a field headquarters in Cincinnati, Ohio, staffed mainly by specialists in toxicology, engineering and analytical chemistry. The Division's medical staff was moved to Cincinnati a year later. Specially trained personnel carry on a continuous study of how man's job affects his health. A training branch helps develop professional personnel.

World Health Organization marked its second full year of activities as a coordinating agency in international health work by establishing a Secretariat on social and occupational health.

1951 Industrial Medical Association took over from the American College of Surgeons the evaluation and certification of medical services in industry. Activities were conducted by the American Foundation of Occupational Health, established by the IMA for professional educational purposes. Standards were

revised and enlarged, to embrace health maintenance as well as health restoration. The name of the foundation was changed in 1954 to the Occupational Health Institute. The institute provides consultation and technical guidance in the development of industrial medical services in new places and serves as a general clearinghouse for information and counsel in the whole field of occupational health. The wide concept of the institute's interest is reflected in the change in wording from "Certificate of Approval" to "Certificate of Maintenance."

Division of Industrial Hygiene, U.S. Public Health Service, became the Division of Occupational Health to reflect more accurately its function of promoting better health for individual workers and its interest in all health problems affecting employee health. An important new concern of the Division became the investigation of health hazards in the production, processing, and handling of radioactive materials and radiation-producing processes.

Labor, Commerce, and Public Health Service Task Force for the Health Resources Advisory Committee of the Office of Defense Mobilization completed recommendations for further strengthening of health and safety standards for employers coming under the provisions of the Public Health Contracts (Walsh-Healey) Act. The committee recognized the special need for safety and health measures in small plants. It estimated that sickness absenteeism in industry, which was reducing the labor force by 2 million man-years, could be cut in half, and that another million man-years could be added to the work force by careful medical-employment teamwork in matching every job applicant to a job he could do well and safely. Through publications and other activities, both the U.S. Public Health Service and the Small Business Administration also sought to encourage health services for small employee groups.

A 3-day conference on the rehabilitation of the handicapped worker over 40 years of age was held at the University of Michigan.

Rhode Island passed legislation requiring any person, firm or corporation, employing 25 to 399 persons in factory, shop, mechanical, or mercantile establishment, to provide for administration of first aid by either a trained first-aid worker, a practical nurse, or a registered nurse. Any person or establishment employing 400 or more persons must furnish a health unit under the direction of a registered nurse.

Women physicians from many countries, meeting in Philadelphia, reported on the occupational problems of housewives and domestic employees.

General Motors Corp. presented $1,500,000 to the University of Michigan to establish the Institute of Industrial Health at Ann Arbor. The broad objectives of the institute are research, education, and service in industrial medicine, health, and safety for the benefit of all men and women in American industry. At that time, General Motors maintained 106 medical departments and employed 125 physicians and 675 nurses, technicians, and other medical personnel to carry out its own health maintenance program.

The Chief of the Atmospheric Pollution Unit, Division of Occupational Health, U.S. Public Health Service, was appointed U.S. Chairman of a cooperative Canadian-United States study of air pollution in the Detroit, Mich., and Windsor, Ontario, area. Officials from a number of public and private agencies and from industry participated in the study.

With the cooperation of industries in the area, 22,404 persons, or 69 percent of the population in Easton, Pa., received chest X-rays. This activity was part of a comprehensive 4-year program sponsored by the Tuberculosis and Health Society of Eastern Northampton County, Pa. The X-ray survey began in 1948 in the small community of Nazareth. Industries in the various communities helped by contributing $1 for each of their workers who was surveyed. Encouraged by the success of this project, several other cities planned programs. The X-rays were examined by chest, heart, and cancer specialists and revealed many ailments that otherwise might not have been discovered.

1952 At its annual meeting, the American Conference of Governmental Industrial Hygienists adopted a resolution regarding the labeling of dangerous substances. The conference resolved to work together with other groups, including the Manufacturing Chemists Association, toward the development of an adequate uniform guide for the labeling of potentially harmful substances.

1953 U.S. Department of Health, Education, and Welfare was created, and included the Public Health Service, the Social Security Administration, the Office of Vocational Rehabilitation, and other agencies.

A major national effort was directed toward the elimination of environmental health hazards, including those related to in-

dustry. Legislation enacted since that year has provided authority for expanded programs to study and control air and water pollution. Responsibility for the collection, collation, and dissemination of data on environmental hazards and radioactivity was delegated to the U.S. Public Health Service in 1958. Activities were intensified following the resumption of atmospheric nuclear testing in 1961.

1954 Vocational Rehabilitation Act was amended to promote and assist in the extension and improvement of vocational rehabilitation service, provide for more effective use of Federal funds, and otherwise improve the provisions of the act.

1955 Council on Medical Education and Hospitals of the American Medical Association authorized the American Board of Preventive Medicine to examine applicants and issue certificates for special competence in industrial medicine, thereby establishing a new specialty.

Legislation was enacted to establish the National Health Survey within the U.S. Public Health Service. The agency conducts a continuing survey to obtain information on the general population of the United States. National estimates of disability among the work force are now available, including data relating disability to industry and occupation.

At its founding convention, the American Federation of Labor and Congress of Industrial Organizations established a Standing Committee on Safety and Occupational Health.

1956 Social Security Act was amended to provide disability insurance for eligible permanently disabled persons 50 years of age and over. Disability benefits were extended to those under 50 in 1960. When Social Security began in 1937, only workers in commerce and industry were considered. Now it covers almost everyone who works for a living, including the self-employed. Employees of the Federal Government, railroad workers, who have their own programs, and agricultural workers are the outstanding groups exempted. Social Security payments go not only to retired and disabled workers but also to their dependents.

1957 Occupational Health Information Exchange was established at PHS Occupational Health Research and Training Facility in Cincinnati to collect and coordinate information on (1) the prevalence and nature of new disease problems in industry, (2) total resources available, and (3) methods for stimulating research in problems under investigation.

1958 At the request of Congress, the Division of Occupational Health, in cooperation with the U.S. Bureau of Mines, undertook a comprehensive revaluation of the problem of silicosis in the mining industry. A total of 14,959 miners and 67 mines were included in the study.

1959 National Health Council, composed primarily of voluntary health agencies, held a forum on the health of people who work. Leaders in industry, labor, and government met with their colleagues in voluntary, professional, and public health agencies. The contribution of voluntary agencies to the furtherance of occupational health was given further study.

Atomic Energy Act was amended to provide for the establishment of the Federal Radiation Council, to advise the President on radiation matters affecting health.

Congressional hearings were held for the first time on the problems of employee radiation hazards and workmen's compensation. A major portion of the hearing was devoted to evaluating protective standards of compensation laws with respect to the threat of radiation disability.

Passage of the Longshoreman's Act empowered the U.S. Department of Labor to establish safety standards for longshoremen and shipyard workers. The law requires that employers meet minimum standards for maintaining safety and healthful working conditions.

Congress enacted the Federal Employees' Health Benefits Act providing for payroll deductions and agency contributions for health insurance for Federal workers. By 1962, 13 States and Puerto Rico were also providing health insurance programs for all State employees.

1960 The Federal Hazardous Substances Labeling Act was passed, to protect consumers from the misbranding of hazardous substances used in industry and in the home.

A new worldwide abstracting service of occupational health and safety literature was established by the International Labor Organization in Geneva. Eleven European countries agreed to participate and negotiations continued with other countries. The PHS Occupational Health Information Exchange was designated the national center responsibile for obtaining abstracts of U.S. occupational health literature. The U.S. Department of Labor was made responsible for occupational safety coverage.

American Board of Industrial Hygiene was chartered as a nonprofit corporation under the laws of the Commonwealth of

Pennsylvania to certify specialists in the field on the basis of education and experience.

The 13th International Congress on Occupational Health was held in New York City. This was the first meeting in the United States.

1961 Community Health Services and Facilities Act was passed. It authorizes PHS grants for community studies and demonstrations to develop new or improved out-of-hospital services, particularly for the aged and chronically ill.

The National Library of Medicine, established in 1956, began work on an electronic data-processing system to improve the capacity to store, retrieve, and disseminate information, including information on employee health.

Conference on Epidemiologic Research in Occupational Health, supported by a PHS research grant, was held at the National Institutes of Health, Bethesda, Md.

A National Congress on Environmental Health, held at the University of Michigan, was cosponsored by the School of Public Health, the American Public Health Association, and the National Sanitation Foundation.

An Area Redevelopment Act was passed, providing Federal financial assistance for industrial projects, public facilities, urban renewal, and occupational retraining in designated areas of chronic unemployment and underemployment. The Secretary of Health, Education, and Welfare is responsible for providing assistance for occupational retraining of persons referred to him by the Secretary of Labor, through contracts with State vocational education agencies or with educational institutions.

President John F. Kennedy established the President's Commission on the Status of Women, to review and make recommendations as needed on employment policies and practices and other matters relating to women in the United States.

Congress enacted Public Law 87–300, authorizing the Secretary of the Interior to conduct a study of the causes and prevention of injuries, health hazards, and other health and safety conditions in metal and nonmetallic mines (excluding coal and lignite mines). The Secretary of the Interior was directed to submit a report and recommendations for an effective safety program within 2 years of the enactment.

The Council of State Governments, Washington, D.C., issued *Proposed Licensing and Registration Regulations*, for sources

of ionizing radiation. The proposed State regulations were designed to meet necessary health and safety standards.

1962 Public welfare legislation was amended to assist the States in rehabilitating the unemployed and in developing better trained staffs to render these services.

Public health legislation was enacted authorizing a 3-year program of project grants for family health service clinics to improve health conditions of agricultural migratory workers and their families.

Passage of Manpower Development and Training Act of 1962 authorizes the Secretary of Labor to determine the skill requirements of the economy, encourage the development of programs, including on-the-job training, to equip the Nation's workers with the new and improved skills that are required. The Secretary of Health, Education, and Welfare is responsible for entering into agreement with States to provide occupational training to unemployed or underemployed persons referred to them by the Secretary of Labor.

Mortality by Occupation and Industry, the first of a series, was issued by the National Vital Statistics Division, U.S. Public Health Service. Entries of occupation and industry on certificates of death of males between 20 and 64 years of age who died in the United States in 1950 provided the basic data. Deaths from selected causes among the various occupational and industrial groups were related to occupational and industrial data from the 1950 Census of Population. Standardized Mortality Ratios were computed.

Division of Occupational Health, U.S. Public Health Service, gave grants for 78 research projects, to support basic and applied laboratory, clinical, and field research into many factors related to the work environment and its impact on health.

A survey of the 100 largest metropolitan areas in the United States indicated that on-the-job health services for employees of these local governments were usually limited or nonexistent. A 1960 survey showed that most State employees had little or no services.

1964 The Chairman of the U.S. Civil Service Commission announced an expanded on-the-job health program for Federal Government workers. Each agency is to provide services for all employees who work in groups of 300 or more. Services may be provided for smaller groups where warranted by working conditions involving special health risks.

SECTION 3

The Concept of Occupational Health

The significant events chronicled in sections 1 and 2 show not only a constantly increasing interest in employee health during the last century, but also a change in the concept of what employee health services include.

Originally, health services at the workplace were usually confined to providing a safe work environment, to care of occupational illness and injury, and in some instances to emergency care for nonoccupational illnesses. In most cases interest in preventive health services and in the total health of the worker is of comparatively recent origin, beginning in the late 1940's and gradually increasing since then.

A recent survey by the National Industrial Conference Board indicates that industries are now devoting considerable time to health maintenance and health education. According to the Conference Board, a transformation has occurred in employee health programs during the last 10 or 15 years and it has not yet ended. Broader objectives are being set, and medical departments are reported to be entering what may be the most significant phase of their existence. This attitude is due to the changing attitude of many company managements, who were slow to realize the full potential of their health programs.

The Conference Board lists six main reasons for management's new policy as follows:

1. An increase in the number of older and disabled workers.
2. Competition for efficient people and the need to safeguard the health of workers now on the payroll—workers in whom the companies have invested time and money.

3. The great number of emotionally disturbed people, many of whom are on company payrolls.
4. Industrial advances—automation and peacetime use of atomic energy (as they affect the individual workers) are new and different problems to the employer.
5. An increasing number of health insurance plans, many of which pay benefits on the first or second day of absence.
6. Encouraging reports about the beneficial results achieved by companies providing occupational health programs.

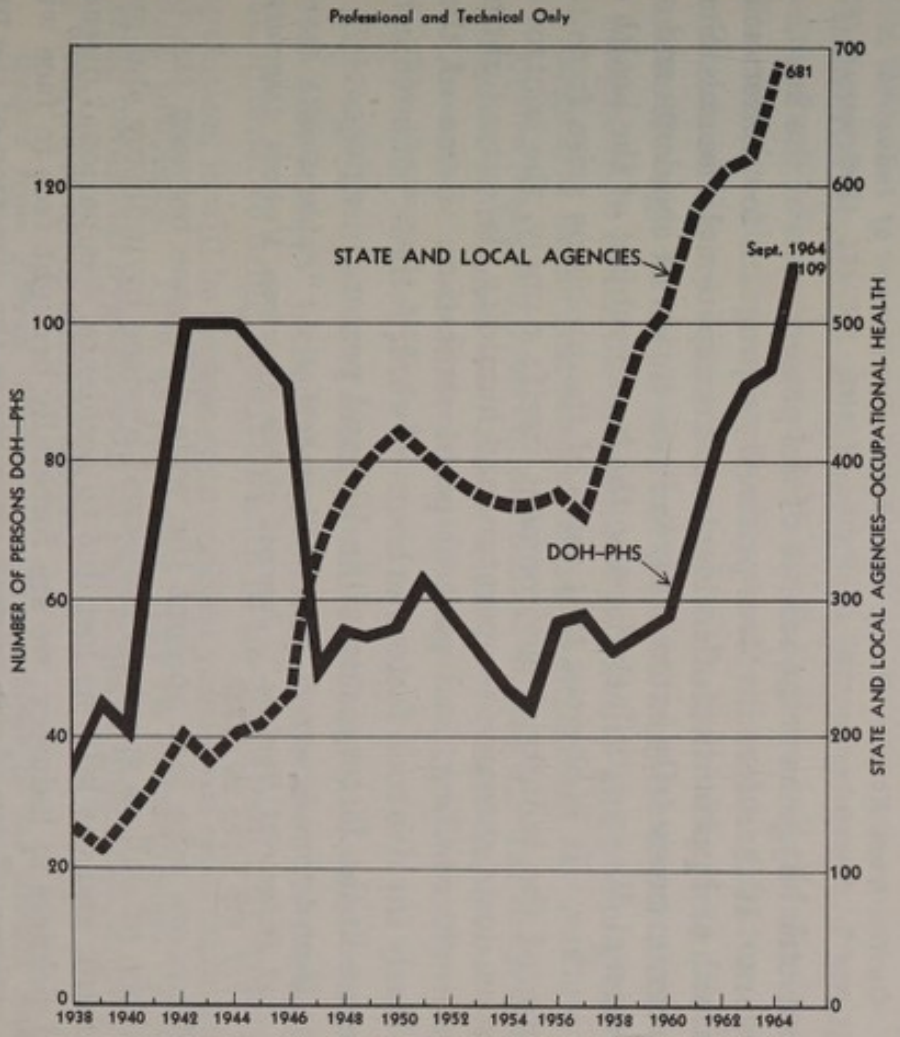
To these six items may be added the influence of physicians, hygienists, nurses, and other professionals with experience in occupational health, who realized long ago that, to be most effective, health in industry must be closely related to both health and social welfare activities. Statements by prominent leaders in occupational health, made over the last 30 years, substantiate this fact. Most of the following statements, which are presented here in chronological order, were selected and brought together in a publication 15 years ago, when the present movement toward preventive services and health education was relatively new:

The problem of the industrial surgeon of today is therefore a far greater one than the relatively simple matter of the handling of trauma, for he should be prepared to handle sanitary, medical, and social problems as well, with at least the following aims in mind: The employee must be physically fit; working conditions must be made safe as possible; proper sanitation, including ventilation, illumination, and temperature control, as well as facilities for body cleanliness, must be provided. Furthermore, it must be realized that contentment and efficiency also depend on living conditions in the home and on the health of the worker's family.

Quoted from Noland, Lloyd: "Problems of Administration in Industrial Surgery." Journal of the American Medical Association, 99: 1215 (Oct. 8) 1932.

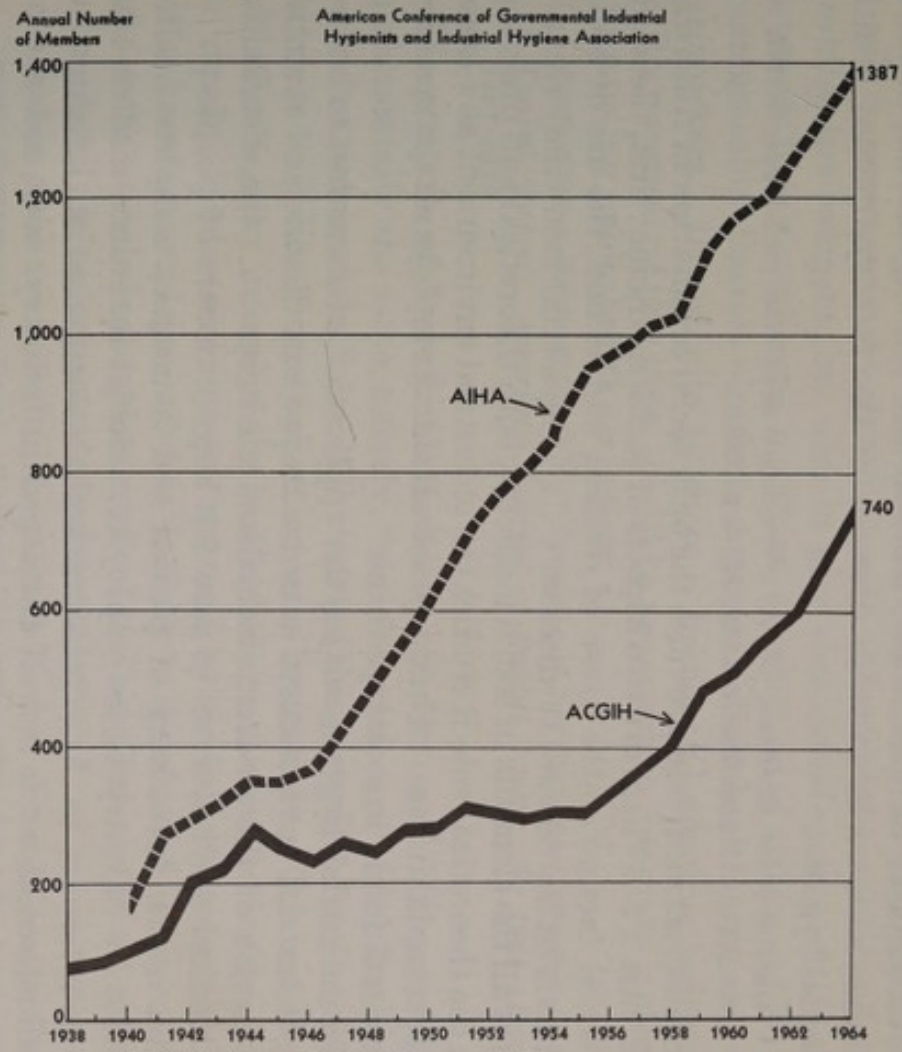
Industrial hygiene is one of the most important topics in preventive medicine and hygiene, as it deals with the health, the welfare and the human rights of the vast majority of the adult population. . . . The object of industrial hygiene is to protect the health of the worker, whether in mines, ditches, factories, stores, ships, farms, banks, or houses. The object of industrial hygiene is also to prevent industrial diseases, but the control of special health hazards does not solve the problems of the health of the worker. Industrial hygiene is nearly as broad as adult hygiene itself—indeed, industrial hygiene runs the whole gamut of hygiene and sanitation. It deals with the problems of industrial poisons and dust; ventilation, temperature and humidity; light, noise and nuisances; cleanliness, plant sanitation, overcrowding;

Figure 1. Trends in Occupational Health Staffs



Source: U.S. Public Health Service, Division of Occupational Health.

Figure 2. Membership Trends



Source: U.S. Public Health Service, Division of Occupational Health.

hours of labor, rest periods and fatigue; child labor; women in industry; workmen's compensation; medical and nursing service, physical examinations, communicable diseases in the factory, mental health, personal hygiene.

Quoted from Rosenau, M. J.: Preventive Medicine and Hygiene, 6th ed. New York, Appleton-Century, 1935, p. 1261.

Industrial medicine provides the only social orientation in American medicine . . . There are two aspects of social medicine: first, the study of social factors as the cause of disease, and second, the use of social methods in the control of disease. . . . [Industrial medicine] recapitulates all the elements of social medicine, both theoretical and practical. On the theoretical side it studies the industrial environment as a causative factor in disease. On the practical side it employs all the measures of control found in social medicine.

In industrial hygiene we see the application of measures to control the industrial environment in order to prevent disease and maintain the health of the worker. Socialized medicine . . . the distribution of medical service, so as to care for large numbers of people . . . is noted in the furnishing of partial and sometimes complete medical service by industry to its employees. Social insurance medicine has its counterpart in American workmen's compensation schemes . . . Medical social work is well developed in industry, with and without organized social welfare departments.

Quoted from Kessler, Henry H.: "Social Significance of Industrial Medicine." American Journal of Public Health, 158–164 (February) 1936.

Industrial hygiene is the science of the preservation of the health of workers. It therefore involves primarily a program for conservation of health and prevention of accidents and occupational disease. Such a program necessarily extends beyond prevention of accidents and occupational diseases; it includes also the broad subject of the health of the worker. It is obvious that some of the problems arise from the nature of the industrial environment itself; namely, the control of poisons, dusts, excessive temperature and humidity, defective lighting, noise, overcrowding, and general plant sanitation. Some of them obviously involve such factors as hours of work, fatigue, communicable diseases in the factory, mental health, and personal hygiene.

Quoted from Sayers, R. R., and Bloomfield, J. J.: "Public Health Aspects of Industrial Hygiene." Journal of the American Medical Association, 111: 679 (Aug. 20) 1938.

When we take into account the wide difference between the few millions of dollars spent on industrial hygiene by industry and government, and the billions lost due to accidents, occupational diseases and sickness in industry, we are forcefully brought face to face with the meager efforts of our present attempts in the direction of the protection and improvement of the health of our workers.

It would seem, therefore, that if we are to improve the general health status of the most important and numerous group in our population, it will be necessary to control not only unhealthful conditions in the working environment, but also to give consideration to such factors as proper living conditions, nutrition, elimination of strain and hurry, communicable diseases—in fact, a general adult health program for our workers. In order to promote a broad and effective industrial health program of this type, it will be necessary to integrate it closely with existing public health activities.

Quoted from Bloomfield, J. J.: "Development of Industrial Hygiene in the United States." American Journal of Public Health, 28: 1934 (December) 1938.

The purpose of Industrial Medicine has been and always will be fundamentally the same, namely, "the adequate care of the health of the industrial workers." . . . Obviously [this] requires further elucidation as to indications, application, and limitations. One employer, for instance, may interpret the words "adequate care" to include only the repair of industrial injuries required by workmen's compensation law. Another employer who is socially minded may interpret the same terms to include complete medical and hospital care of the worker and his family in order to attain "adequate health."

Quoted from Newquist, M. N.: Medical Service in Industry and Workmen's Compensation Laws. Chicago, American College of Surgeons, 1938, p. 1.

Industrial hygiene is the science of the preservation of the health of the workers. It is concerned with adult hygiene and the elimination of causes of morbidity and mortality whether caused by factors inside or outside of the working environment. Industrial hygiene provides a means through which all the facilities of the health department may be integrated to lower the incidence of morbidity and prolong the life of a large and important section of our population.

Quoted from Gray, Albert S., and Osborn, Stanley H.: "The Integration of Industrial Hygiene and Public Health." Transactions of the Second Annual Conference of Governmental Industrial Hygienists. Washington, The Conference, 1939, p. 11.

Although occupational diseases and accidents still constitute your major activities, . . . there has gradually come about a realization that, in order to bring positive health to the large gainfully employed population, it will be necessary to concern yourselves with other adult health problems. This, as you know, may be accomplished by integrating industrial hygiene with all public health functions, employing the work place as the scene of action.

Quoted from Parran, Thomas: In Transactions of the Second Annual Conference of Governmental Industrial Hygienists. Washington, The Conference, 1939, p. 2.

Industrial health service as exemplified by [full-time industrial physicians] . . . is fundamentally preventive medicine. Its object is to furnish the employed population the best possible health protection consistent with: (1) The purpose of industry, which is to carry on its business; (2) the employer's responsibilities as fixed by law, which are the prevention, care of, and compensation for occupational injuries and diseases; (3) the duties and objectives of official and nonofficial health agencies, which are distinctively in the field of preventive medicine; and (4) the employee's rights as to free choice of a physician in the care of sickness and injuries, not legally related to occupation. . . . from the standpoint of . . . the foregoing, health service in industry is found to comprise several functions . . . industrial hygiene, physical supervision, therapy, rehabilitation, diagnostic tests, health instruction, records, and research.

The scope of industrial health service may be summarized as follows: It is responsible for the protection of working people against possible sources of disease in the plants, their safe placement, the subsequent supervision of their health in relation to employment and the treatment of conditions that result from occupation. It is the plant physician's privilege and duty to cooperate with the general profession and departments of health in their respective efforts to treat and reduce general sickness. Industrial medicine, general practice, and the public health are complemental. To conserve human values is their common purpose.

Quoted from Selby, C. D.: "Scope and Organization of Health Service in Industry." Industrial Hygiene (edited by A. J. Lanza and J. A. Goldberg). New York, Oxford University Press, 1939, p. 4.

We may define industrial health as a specialized form of medical and public health practice, combining certain elements of medicine, engineering, chemistry, toxicology, psychology, sociology, statistics, and the principles of the prevention of disease and health promotion, to the end result that the physical and mental efficiency of the worker is increased and production bettered in quality, quantity, and permanency.

Quoted from Sappington, C. O.: Industrial Health: Asset or Liability. Chicago, Industrial Commentaries, 1939, p. 5.

The purpose of industrial health programs is to promote and maintain the physical and mental welfare of all industrial employees. . . . These objectives should be accomplished by—

1. Prevention of disease or injury in industry by establishing proper medical supervision over industrial materials, processes, environments, and workers.

2. Health conservation of workers through physical supervision and education.

3. Medical and surgical care to restore health and earning capacity as promptly as possible following industrial accident or disease.

Quoted from American Medical Association, Council on Industrial Health: "Medical Service in Industry: Outline of Procedure for Physicians in Industry; Industrial Health Examinations." Journal of the American Medical Association, 118: 895 (Mar. 14) 1942; 125: 569 (June 24) 1944.

Industrial hygiene is concerned with every phase of the health of the man behind the machine, whether it is the industrial dust in the air he breathes or the food his wife has packed in his dinner pail. In short, it is the problem of keeping the worker on the job, and in good health, so that he can work at top efficiency.

Quoted from Townsend, James G.: "The Problem of Industrial Hygiene." New Orleans Medical & Surgical Journal, 95: 505 (May) 1943.

As [industrial] hygienists, you hold an important place in industry and public health in the control of occupational and traumatic diseases primarily the result of chemical and physical agents. Through your training and knowledge of certain basic sciences and in cooperation and consultation with the plant physician you have introduced engineering principles, safety and sanitary sciences, toxicology and control tests, to develop an environment as a safe place for the worker; this is a job that demands eternal vigilance to curtail morbidity and mortality, with emphasis on logical reasoning and observations. . . . Industrial hygiene and epidemiology are absolutely essential in preventive industrial medicine and cannot be divorced.

Quoted from Legge, Robert T.: "A Historical Background of Industrial Hygiene." American Industrial Hygiene Association Quarterly, 7: 5 (June) 1946.

Some advances have recently been made but the conception of industrial medicine in this country has, on the whole, remained circumscribed. In some parts of the country it has not developed far beyond its initial interest in traumatic surgery to patch up the injured worker. As workmen's compensation laws have been passed in various States, industrial medicine has centered on accident prevention, in which industrial physicians participate along with safety engineers. When occupational diseases came within the province of the workmen's compensation acts, their control became one of the functions of the industrial physician working with industrial toxicologists and engineers. It is only within recent years that the scope of industrial medicine has come to embrace broader aspects of health promotion and sickness prevention, including nutrition and psychiatry. . . . With fuller collaboration of the medical profession, of employers and labor, and of the government, industrial medicine can play a preventive and a curative role far beyond its present scope.

Quoted from Stern, Bernhard, J.: Medicine in Industry. New York, The Commonwealth Fund, 1946, pp. 185–186.

This whole subject of occupational health and medicine is analogous to a three-legged stool, one leg representing medical science, one representing engineering and chemical science and one representing the social sciences. . . . Up to the present we have been trying to balance ourselves on two legs and in some instances on one leg. It is a very uncomfortable position and one that cannot get us very far and certainly will lead, as it has, to fatigue.

Quoted from Hussey, Raymond; In discussion of article by Hemeon, W. C. L.: "Engineering in Industrial Health Education." Occupational Medicine, 4: 204 (August) 1947.

There are at least seven more or less distinct functions involved in the promotion of industrial health [environmental health, health education, preemployment physical examinations, diagnostic services, first aid, treatment of disease, rehabilitation]. . . . For the provision of these seven types of service, there are four different agencies in the picture: Industry, labor, the medical profession, and the public; and any two or more of these agencies may cooperate in solving parts of the problem. The possible complexities of administrative relationship stagger the imagination. . . . There is no single, perfect solution of this problem now in sight. There is rather a challenge to the inventiveness of management, labor, the medical profession, and the public to find empirically the best plan that will fit a given local situation. For management and labor, the need for cooperation in the meeting of a common problem is called for rather than insistence on vested interests. For the medical profession, it seems certain that the principles of group payment and group practice must be essential to any sound solution. For the public-health authorities, leadership in research, formulation of reasonable standards of attainment, and assistance to small industries, where desirable, would appear to be the appropriate role.

Quoted from Editorial: American Journal of Public Health, 37: 1337–1339 (October) 1947.

Industrial medicine is concerned as much with the environment as with the man. To study man in his environment, to understand the man and to control his environment as his needs require—these are the essential goals of industrial hygiene. It is clear that these cannot be achieved by physicians alone. They require the collaboration of the social, biologic and physical sciences and disciplines in research, practice and instruction.

Quoted from Kehoe, Robert A.: "Significance of Industrial Health." Occupational Medicine, 4: 399 (October–December) 1947.

Industrial health, or industrial hygiene as it is commonly called, is concerned with the prevention of occupational diseases and the maintenance of the health of industrial workers on a high level. It requires the combined efforts of a variety of professional personnel,

most important of which are engineers, physicians, chemists, and nurses. The industrial physician and nurse are concerned with the well-being of the worker, while the industrial health engineer and chemist are concerned with the condition or "well-being" of the worker's environment. The entire program is preventive rather than curative in nature.

Quoted from Brandt, Allen D.: Industrial Health Engineering. New York, John Wiley & Sons, Inc., 1947, p. v.

From the early concepts, which made the industrial physician's chief interest the administration of first aid to the injured, we have reached a stage of progress where the potential hazards of industry are neutralized before they have actually inflicted harm. From its fragmentary beginnings industrial medicine has attained to the development of highly organized programs of health conservation which affect the well-being of that large part of our population engaged in the labors of industry.

Quoted from Hazlett, T. Lyle: "Industrial Medicine—Historical Notes." Introduction to Industrial Medicine. Chicago, Industrial Medicine Publishing Co., 1947, p. 6.

Medicine has been inclined to approach the subject [industrial hygiene] in terms of occupational diseases; public health has had a broader approach, regarding workers as individuals who, because of the combined hazards of occupation and industry, including economic disadvantages, constitute a group for which special precautions must be exercised. The precautions applied relate to those hazards peculiar to a given occupation or industry, or both, plus ordinary public-health practices in such fields as nutrition, tuberculosis, syphilis, etc., being concerned not only with working conditions but with the worker's home and its environment, with his family, their recreation and health education, and their ability to obtain medical, nursing, dental, and hospital care.

Quoted from Mustard, Harry S.: An Introduction to Public Health, second edition. New York, The Macmillan Co., 1947, p. 169.

I define industrial medicine as the broad field which is concerned with all of the health problems of employed persons, and industrial health as the objective of industrial medicine. In other words, industrial health is the end and the practice of industrial medicine is the means. Industrial hygiene I consider to be that subdivision of industrial medicine which deals primarily with the prevention of illness, occupational or nonoccupational, through methods applied to the working environment or to the employed individual.

Quoted from Goldwater, Leonard J.: "Future of Industrial Medicine." Industrial Medicine, 17: 27 (January) 1948.

Industrial hygiene is primarily concerned with relationships between the health of the worker and the stresses of his occupation and

industrial environment. It has become a special technical field because these relationships can, in large measure, be expressed in quantitative terms. Thus, it becomes possible to measure environmental factors and from the findings to predict their effects upon the workers.

The objective of public health is to promote and maintain good health in the greatest possible number of people through organized mass attacks. Industrial hygiene, in its broadest sense, provides the means for such direct attack upon the ills of a most important fraction of our total population. The maintenance of the health and well-being of industrial workers is essential to the economic and social well-being of the Nation.

Quoted from Hatch, Theodore F.: "Expanding Horizons in Industrial Hygiene." Harvard Public Health Alumni Bulletin, 5: 9–11 (May) 1948.

By industrial medicine, I mean the whole range of medical art, science and skill applied to industry, including internal medicine, surgery, preventive medicine, and all the ancillary professional skills, such as engineering, chemistry, nursing, etc.

Quoted from Shepard, W. P.: "What Kind of Specialty Is Industrial Medicine?" Industrial Medicine, 17: 209 (June) 1948.

Concomitant with the change of status of the American worker, there has been a metamorphosis within recent years in industrial health practices and methods. Reorganizing the demands of modern industrial enterprises for a manpower capable of maintaining ever-rising production schedules, medicine has attempted to offer a program capable of keeping the healthy worker healthy and on the job. Within-plant medical care schemes of two or three decades ago have grown in scope to become the rich preventive medicine services seen in present day enlightened industry. This demand for better health maintenance of the worker obviously was increased by the exigencies of war but fortunately, the methodologies developed by the industrial health forces have persisted in the peacetime state and are meeting with studied refinement.

Quoted from Felton, Jean Spencer: "Industrial Medicine Comes of Age." West Virginia Medical Journal, 44: 239–244 (September) 1948.

Although occupational medicine has been designated in recent years as a specialty, it is by no means a restricted specialism. If properly practiced, it approaches a return to the intimate concern of a physician for his patient, so nobly exemplified by the old family doctor. In this respect occupational medicine stands in sharp contrast to the limited specialties in medicine. For occupational medicine is not interested in the patient's eyes alone, or his allergy, or his heart. It is interested in man and all that aids or hinders his welfare. In the rise of preventive medicine, occupational medicine has assumed the foremost role. . . .

Industrial medicine contends that we must cease looking upon the working man as an 8-hour-a-day problem, in which only his occupational environment is of concern. No longer can the industrial laborer be classified as a mechanical component of the machinery of industry. We have realized that the worker is a member of society, whose working, playing, and living is a 24-hour problem. Such a concept entails consideration of all his faculties, his capacities as well as his deficiencies. It includes a program which will safeguard his hearing, his vision, his nutrition, his skills, aptitudes, experience, intelligence, and emotions. It is the object of industrial medicine to utilize the cardiac, the epileptic, the cripple, the blind, the elderly, and all those who desire to work instead of being forced to accept the beneficence perpetrated upon them by an unwitting Government. Man's work is related to his home, his social environment, his philosophy, his economics, and his happiness. Adjustment of these relationships in the largest segment of our adult population can be achieved by utilizing the facilities which industrial medicine has to offer.

Quoted from Johnstone, Rutherford T.: Occupational Medicine and Industrial Hygiene. St. Louis, C. V. Mosby Co., 1948, pp. 7, 23.

The purpose of industrial hygiene is to preserve and improve the health of industrial workers.

Industrial hygiene has become an important part of public-health activity. Its integration with a broad public-health program requires particular emphasis on (1) the influence of physical and mental characteristics of workers upon the incidence of disability, other than occupational, and (2) the opportunity for extending medical care to millions of workers and their families.

Quoted from Daliavalle, J. M.: The Industrial Environment and Its Control. New York, Pitman Publishing Co., 1948, pp. 3, 11.

Industrial hygiene may be defined as the science and art of preserving health through the recognition, evaluation, and control of environmental causes and sources of illness in industry. It resolves itself into the problem of finding factors or conditions in workplaces that may cause or contribute to the illness or serious discomfort of employees, and of devising methods and means of eliminating or controlling such conditions.

Quoted from Patty, Frank A.: "Preface." Industrial Hygiene and Toxicology, Volume 1. New York, Interscience Publishers, Inc., 1948, p. vi.

The following four points are widely approved by medical authorities as major objectives of a company medical service:

1. To ascertain, by examination, the physical and mental fitness of employees for work.

2. To maintain and improve the health and efficiency of those already employed.

3. To educate the worker in accident prevention and personal hygiene.

4. To reduce lost time and absenteeism from illness or injury.[1]

It is unnecessary to belabor the point that the overall objective is to increase the company's profit by having healthier employees who are apt to be safer and more efficient workers.

Quoted from Spears, Ethel M.: Company Medical and Health Programs (Studies in Personnel Policy, No. 96). New York, National Industrial Conference Board, Inc., 1948, p. 5.

Occupational medicine deals with the restoration and conservation of health in relation to work, the working environment and maximum efficiency. It involves prevention, recognition and treatment of occupational disabilities, and requires the application of special techniques in the fields of rehabilitation, environmental hygiene, toxicology, sanitation and human relations.

Quoted from American Medical Association, Council on Industrial Health. In Brown, Ernest W.: "Recent Developments in the Field of Education in Industrial Medicine." Southern Medical Journal, 42: 591 (July) 1949.

Industrial hygiene is concerned primarily with prevention. It is the duty of the industrial hygienist to determine the causes of, and to prevent industrial illnesses, not to diagnose and treat them. He reports upon the extent of the hazard, if any exists, and its control.

Quoted from Drinker, Phillip: "The Practice of Industrial Hygiene." American Industrial Hygiene Association Quarterly, 11: 101 (June) 1950.

Industrial medicine involves the application of two skills—medicine and engineering—it is concerned with the environment of the industrial worker as well as with the effects of that environment upon his physical and mental structure. These two skills are equally essential and no program which does not include their coordinated activity will be effective . . .

The industrial physician is concerned with occupational diseases, occupational injuries, preventive medicine, and administration, including the maintenance as well as the utilization of records, and the function of industrial nursing. We must also add to the foregoing the peculiar hazards of radiant energy. It should be noted that increasing emphasis is being placed upon the preventive aspects of the physician's work. In addition there are certain related subjects which are of utmost importance as well as of increasing complexity in both their scope and administration. In this second group are included the following:

1. Workmen's compensation and also the application of insurance principles to benefits for nonoccupational injury and sickness, including hospitalization and dependency benefits. Both the full-time in-

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[1] "Medical Service in Industry and Workmen's Compensation Laws," American College of Surgeons, Chicago, Illinois, 1946.

dustrial physician and the part-time physician need to be thoroughly conversant with both the occupational and nonoccupational types of benefit. In every instance these benefits cannot become operative, as far as the individual worker is concerned, without the physician's signature. The expansion of both occupational and nonoccupational benefits marks one of the great social advances of our times and the physician who comes into contact with these laws and contracts needs to be conversant with both their content and underlying philosophy.

2. Rehabilitation, which is at last beginning to come into its own. Included here are not only the rehabilitation of those maimed by accident but also those suffering from organic disease—the diabetic and the cardiac and hypertension cases.

3. Geriatrics and its application to the needs of the workers in the older age groups. Here is a challenge to the industrial physician which is becoming more emphatic with every passing year.

4. Psychiatry—the application of psychiatric techniques—is recognizing and dealing with emotional conflicts among industrial workers. As has been expressed on more than one occasion, we do not need a psychiatrist in every industrial plant, but we do need psychiatry in industry.

Quoted from Lanza, A. J.: "Education in Industrial Medicine." American Journal of Public Health, 40: 731–732 (June) 1950.

The field of occupational medicine is becoming more complex, and increasing in scope as industrial technology expands. No longer can the industrial physician, nurse, or part-time medical consultant to industry stand aloof and function merely in a purely professional capacity. Whether the industrial physician approves or not he finds himself involved, along with his medical duties, in the medical and administrative phases of industrial and employee relations, including welfare, pension, and sickness benefit schemes.

Quoted from Fleming, A. J. et al: Modern Occupational Medicine, Philadelphia, Lea and Febiger, 1960. 587 pp.

The objectives of an occupational health program, as outlined by the Council on Occupational Health of the American Medical Association, are: (1) to protect employees against health hazards in their work environment; (2) to facilitate the placement and insure the suitability of individuals according to their physical capacities, mental abilities and emotional make-up in work which they can perform with an acceptable degree of efficiency and without endangering their own health and safety or that of their fellow employees; (3) to assure adequate medical care and rehabilitation of the occupationally ill and injured; and (4) to encourage personal health maintenance.

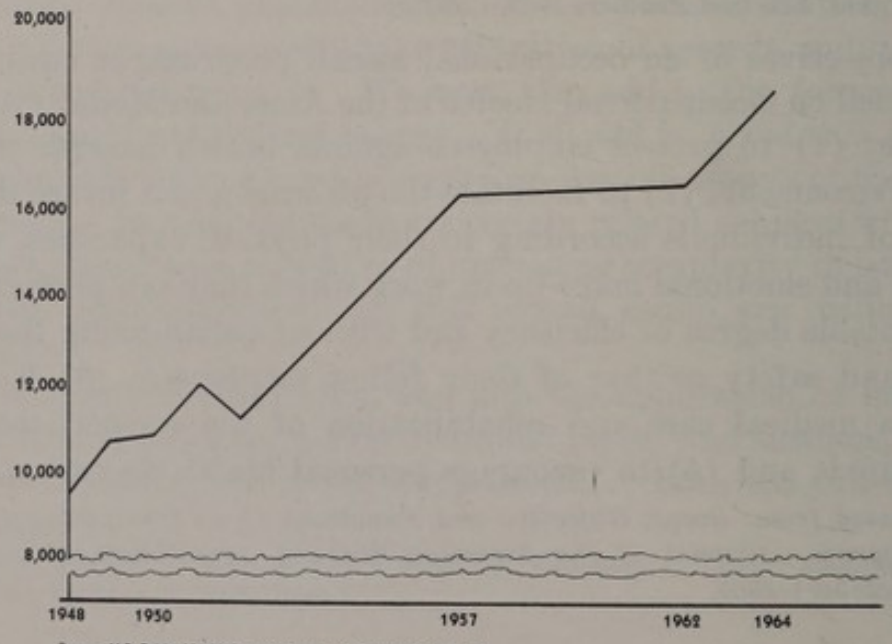
Quoted from: Scope, Objective and Functions of an Occupational Health Program. Journal of the American Medical Association, 174: 533–536 (October) 1960.

When I use the term "occuaptional health," I use it in its all-embracing sense to include, first, the adequate safeguards through appropriate regulations and safety requirements—a full and growing, comprehensive tackling of the problem of effectively preventing the destruction of our occupational health. Our workplaces must be clean, well lit, well ventilated, and so designed and run as to keep to an absolute minimum the impairment of workers' health by virtue of their job performance. Prevention requires not only comprehensive regulation, which is kept dated to changes in our industrial scene, but it naturally also must depend upon adequate and fair enforcement by well-trained inspection staffs not subject to political pressures, who hold their jobs on the basis of proven ability and with career status. When I use the term "occupational health," I also include realistic medical care, the full program of workmen's compensation, comprehensive second injury funds and rehabilitation programs for those who nonetheless experience a job-incurred loss of their health.

Quoted from Brownlow, James A., President, Metal Trades Department, AFL–CIO: At International Congress on Occupational Health, 1960.

In accordance with the trend of modern public health practices toward the integration of different health services into a single comprehensive program, occupational health must be viewed as one aspect of the total question of national health protection and promotion. Many of the public health techniques could be more effectively applied to workers at their places of employment, thus making easy contact with the working adult at his job—just as, for example, children can be easily reached through health services at schools. . . . As WHO is interested in the total health of the individual, in his physical, mental and social well-being, it is, therefore, apparent that the Organization's approach to the problem of occupational health should be

Figure 3. Registered Nurses Employed Full Time by Industry



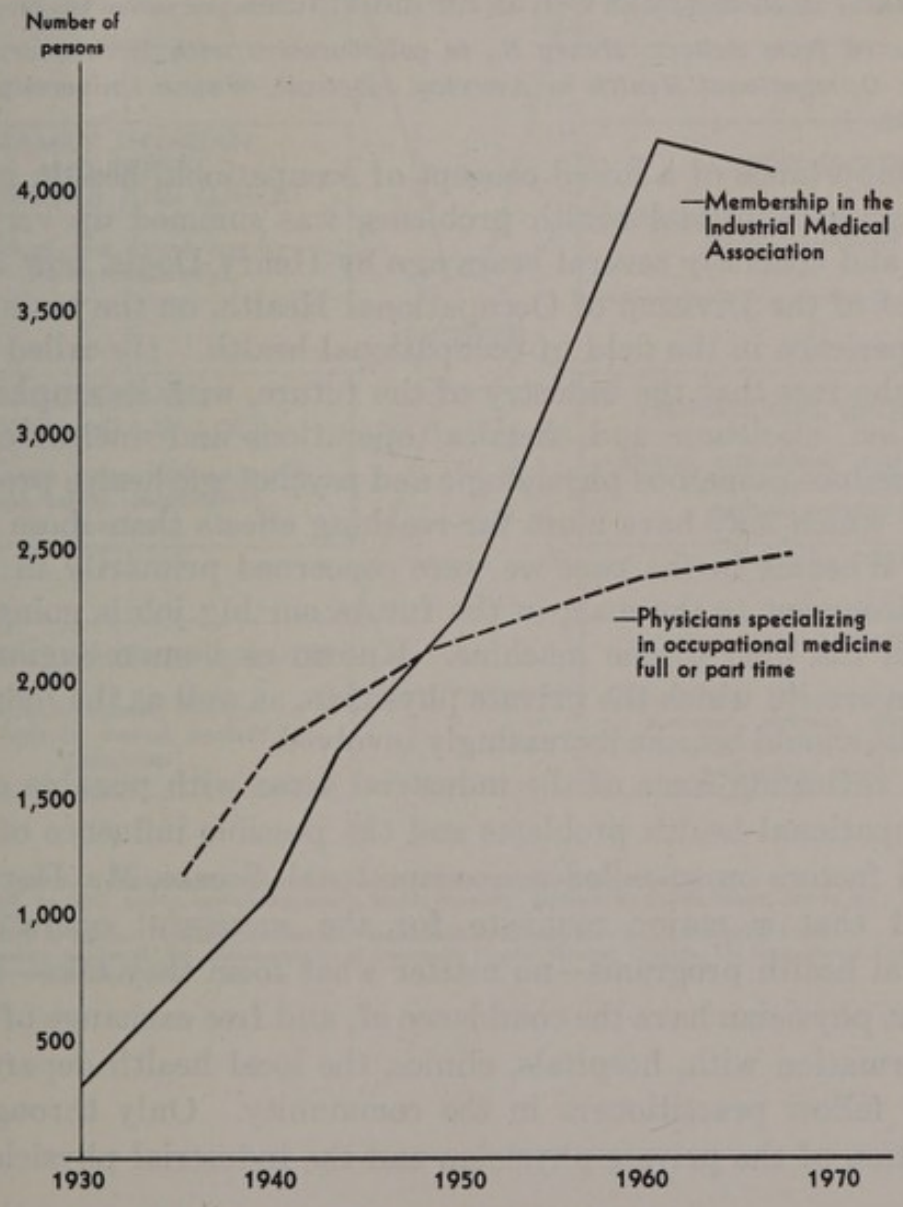
Source: U.S. Public Health Service, Division of Occupational Health.

directed toward the over-all protection of the workers and their families, rather than toward the prevention of occupational diseases and accidents. . . . However, in addition, certain specific measures are needed to bolster the development of a specified occupational health service to meet the particular needs of the working segment of the population; to interest management and labor in the question through their respective organizations; to study the various elements of the occupational environment and their impact on health; to investigate the epidemiology of occupational diseases and injuries; and to promote research into the protection of occupational health.

Quoted from Shock, M. O., Chief Medical Officer, Social and Occupational Health, World Health Organization, Geneva: At International Congress on Occupational Health.

"Occupational health, according to modern concept, is preventive medicine and public health practice as applied to all people at work—not only to persons employed in industrial plants, but also to farmers,

Figure 4. Physicians Serving Industry



Source: U.S. Public Health Service, Division of Occupational Health.

miners, shopkeepers, clerks, and professional and technical persons. It is an important part of the community-wide plan for health promotion of all age groups and of all elements in the community. It is a subdivision of adult health, with special interest in the employable and employed age groups, 20–65 years. Occupational health as it is defined indicates a basic interrelationship among industry, labor, medicine, public health and the community.

Quoted from Confrey, Eugene A., ed.: Administration of Community Health Services. Chicago, International City Managers Association, 1961.

Comparing the "cigar-box" first-aid stations of half a century ago with the superbly equipped and expertly administered departments of this latter day, one may wonder: "What miracle is this?" There has been none, unless to combine the highest of practical ideals with the hardest of hard work may be called a miracle. Modern occupational medicine is a specialty that brings together all specialties—physiology, pathology, bacteriology—of an environmental, psychological and social nature. It has translated tools created by the other specialties into health conservation for masses of people in business and in industry as well as for individuals.

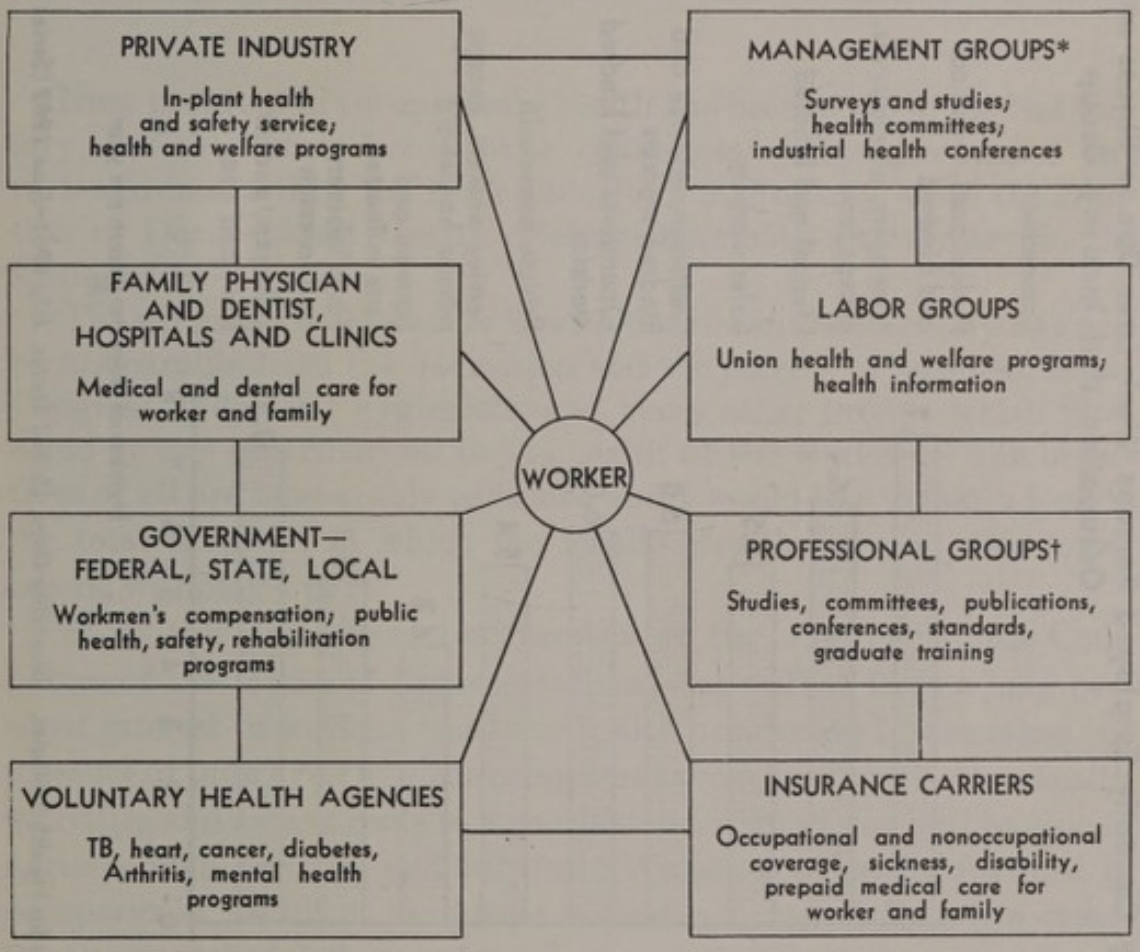
Quoted from Selleck, Henry B., in collaboration with Whittaker, Alfred H.: Occupational Health in America. Detroit, Wayne University Press, 1962.

The importance of a broad concept of occupational health, in view of emerging industrial health problems, was summed up very adequately and concisely several years ago by Henry Doyle, now Assistant Chief of the Division of Occupational Health, on the basis of his long experience in the field of occupational health. He called attention to the fact that the industry of the future, with its emphasis on automation, electronic and chemical operations and nuclear energy, may introduce numerous physiologic and psychologic health problems, some of which may have more far-reaching effects than those of the past. "Whereas in the past we were concerned primarily in fitting the environment to the man, in the future our big job is going to be to match the man to the machine. Known as human engineering, this is an area in which the private physician, as well as the industrial physician, should become increasingly involved."

After reviewing some of the industrial areas with possible emerging occupational health problems and the possible influence of occupational factors on so-called nonoccupational disease, Mr. Doyle emphasized that a major requisite for the successful operation of industrial health programs—no matter what form they take—is that the plant physician have the confidence of, and free exchange of medical information with, hospitals, clinics, the local health department, and his fellow practitioners in the community. Only through the cooperation of the private physician and the industrial physician can

we hope to realize the full potential of such programs through the early detection and prevention of disease. Industrial physicians are still relatively few in number and the bulk of industrial medical practice is handled by the general practitioner. This places the general practitioner squarely in the middle of the industrial health field. It gives him both an opportunity and a responsibility to develop the medical data that is so badly needed in many vital areas. "By helping to solve health problems as they arise, we are contributing to the economic and social well-being of the community as well as the individual," Mr. Doyle commented. "The industrial potential of American industry is in part dependent on the worker being able to enter a new industrial era unafraid of the future and assured that all measures have been taken to protect his health."

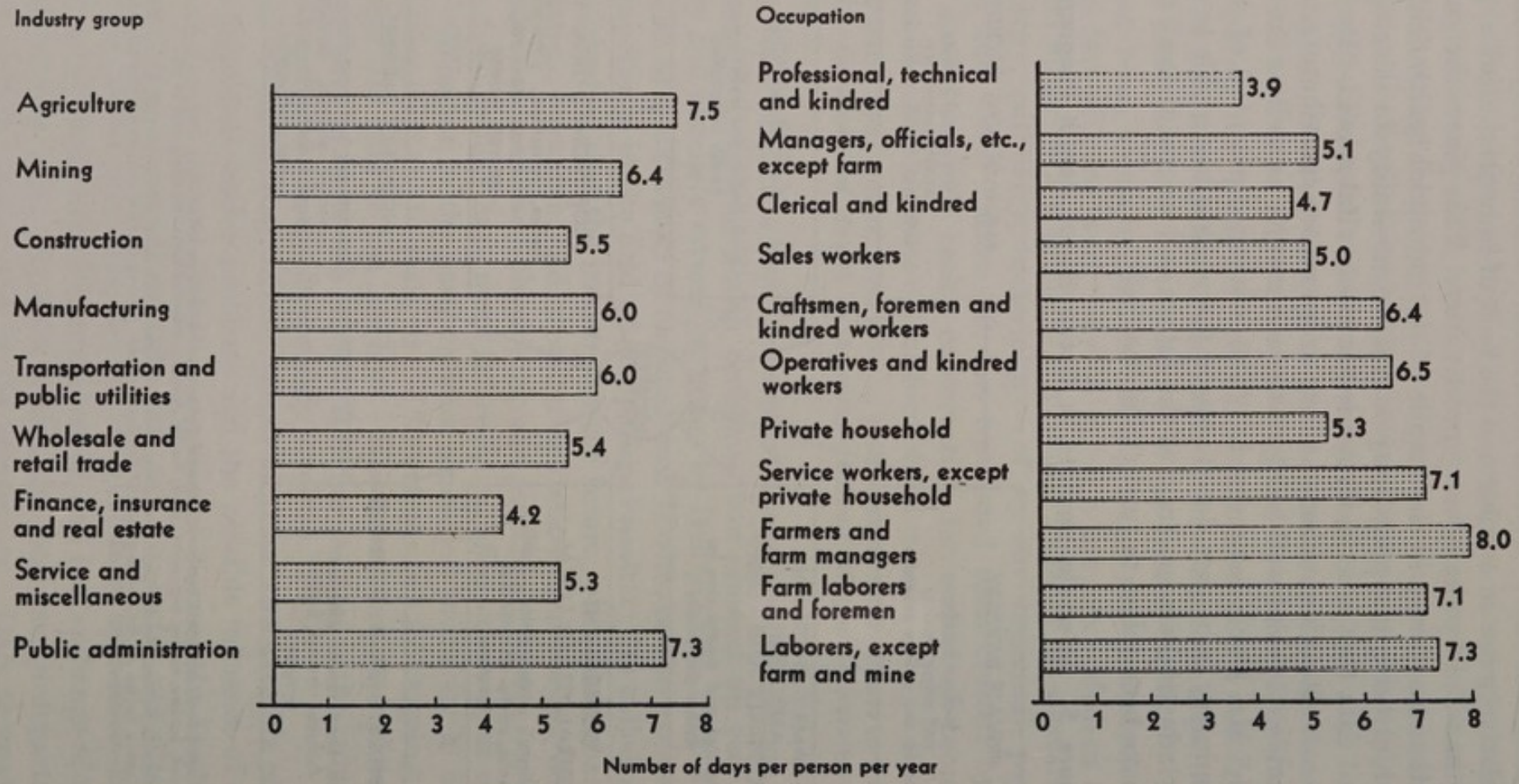
Figure 5. Interrelationships in Occupational Health Programs



*Trade associations, chambers of commerce, personnel management associations, and so on.
†Medicine, dentistry, nursing, engineering, public health, chemistry, industrial hygienists, safety, and so on.

Sources: Ralph R. Sullivan, Director, Occupational Health Section, Oregon State Board of Health, 1959.
Confrey, Eugene A., Ed., *Administration of Community Health Services*, Chicago, The International City Managers' Association, 1961. 560 pp.

Figure 6. Among Currently Employed Persons Work Loss Due to Illness and Injury Varies But Is High in Every Occupation and Industry Group



Source: National Center for Health Statistics. *Disability Days, United States, July 1961–June 1962 (Series 10, No. 4).* Washington, U.S. Government Printing Office, 1963.

SECTION 4

The Future

Great progress in occupational health has been made in the last century, but the future holds many challenges. What lies ahead was reviewed in detail by the Honorable John E. Fogarty, when the Division of Occupational Health celebrated its 50th anniversary in the spring of 1964.

"The progress of the Public Health Service in the next 50 years will be inseparable from the dedication and the success of business, labor, Congress, industrial hygienists, and many other groups which have made unique contributions to the health of the workers. The objectives of all are inseparably entwined and I would like to take a look at the total program in which the Public Health Service, with many others, will play a part . . . .

"From this experience [as member of the Appropriations Committee of the House of Representatives]—as well as from a long personal interest in workers and their health problems—I have taken the measure of industrial hygiene programs as compared with other health activities and I have come to a conclusion I suspect you will be able to agree is both accurate and helpful. We are not moving forward in occupational health at an adequate pace . . . especially when measured against the job that *could* be done . . . .

"The future of industrial health could be magnificent. The possibilities are vast. If we resolve to work so that no individual worker will endanger either his life or his good health through the means by which he makes his livelihood, we will have undertaken a large task. I firmly believe, as I am sure we all do, that no man or woman should be expected to risk physical debilitation, pain, disease of skin or of the lungs, or a shortening of life in exchange for the wage received as an

employee. But we need to think more imaginatively and generously than this.

"There is growing recognition that a country's greatest resource is its people . . . . I would like to propose that our sights be raised so that employment anywhere—in the trades, in commerce, in any and all occupations—will become synonymous with good health. Our goal should be expanded so that the vigor of our working men and women will become a matter of national pride, an accepted part of the culture and heritage we pass on to coming generations. We are far from this objective at the present time and we are not moving at a pace likely to achieve it soon.

"The primary reasons for our lack of progress lie in a whole series of complexities, such as jurisdictional barriers between programs which should be closely knit; inadequate staffing of State occupational health programs; the inability of small plants, in particular, to provide health services to their employees; and a general slowing down of the initial enthusiasm and effort which has lulled the public and many of us, too, into behaving as though there were no more big challenges in occupational health . . . . We need to determine some priorities, plot a course of action, and summon the support of all who should be concerned.

"With more than 70 million workers to consider, our planning must be broad and yet realistic, bold and yet down-to-earth. For example, what do we really know about the current health of these 70 million workers? What do we know about the causes of illness, and the actual incidence of sickness and death, by occupation? We know too little. There is no efficient reporting of occupational morbidity and mortality rates at the present time. Although the importance of gathering data, as a foundation for adequate planning, has been accepted for years, in this field the job is not yet being done. . . .

"Knowing what our occupational health problems really are would give us a solid start toward parceling them out and coordinating them through the many agencies that have, and will continue to have, a hand in occupational health.

"It is obvious that in any major effort to determine a course of action, and to follow through on it, we will need to coordinate the activities of a variety of programs—workmen's compensation; old age, survivors', and disability insurance; Federal and State health programs; union health programs; and others. We all know that these programs could achieve better results by working together than by pursuing their separate, and sometimes even competing, ways. There is an overlapping of functions, and of expense, in our present lack of cooperation. We are paying more than once—and sometimes more than twice—for the same activity, performed by different agencies, and still not getting the quality of service we should. We should be welding the efforts of

industry, the universities, government, unions, doctors, nurses, technicians, and all industrial hygienists to bring about the best results for improving individual health.

"The start can be made almost any day and—as you know—could be as simple as dialing the phone number of a cooperating agency or mailing a report to a newly assembled mailing list. These are the raw materials of coordination upon which large achievements can be built. They are used too little.

"For years we have been talking about the difficult problems of providing health care to workers in small plants, where some 80 percent of American employees work. But there is no concerted action at the present time to bring to these employees the benefits of on-the-job health care and protection. Although some of the large plants have provided diagnostic and preventive services far beyond what is required by the law, there are no in-plant health programs for the majority of workers. . . .

"The problem of providing health services to small plants is so big, we cannot stop hunting for solutions even when some that we try don't work. In some instances, we have set up mobile units and geographical centers and they haven't sufficed. There must be ways, then, that we haven't thought of yet and ways that we haven't tried. It is a big challenge for you people here. If the old ideas are inadequate, can you and others like you think of something new?

"Certainly you need the assistance and support of many more trained industrial hygienists than are available now. I am sorry to find that this nation is so understaffed, insofar as industrial hygiene is concerned. . . .

"State and local government units, particularly, are crippled by the lack of available top-notch technical and professional personnel. This applies to all professions—engineers, physicians, chemists, physicists, toxicologists.

"We must figure out ways by which training and education can be stepped up to produce larger numbers of industrial health specialists, and we must highlight inducements which will influence some of the best students to choose industrial hygiene for their career. . . .

"We are all aware that many industries and jobs have so increased in complexity that large amounts of money must be invested in training the individual worker. The more costly it becomes to have a man off the job, the more important it will be, from an economic point of view, to insure that he stays well.

"Humanitarian motives aside, it is good business—for industry and the community—to prevent illness and accidents, no matter where they occur. Thus the artificial barrier between the health of the man at work and away from work is crumbling. This may be the most important single development of the coming half century.

"Workers spend some 40 hours a week on the job compared with more than 120 off. The health effects of the off-duty environment have increased over the decades as the hours of the work-week have diminished. Also, in today's world, off-duty health risks are sometimes greater than on-the-job risks. . . .

"Congress and the public have heard a great deal in recent years about the subtle insults to health from a variety of environmental hazards—polluted air, contaminated water, radiation, food poisoning and many others. We have begun to get the point that we are living in an entirely new, and very complex world, in which chemicals and nuclear power and other forces—somewhat outside the comprehension of most of us—may affect our health and the health of future generations. . . .

"Occupational health research has made, and can continue to make, major contributions to medicine in general and, in turn, can benefit from developments and findings in other areas of medicine. For example, the tests recently devised for diagnosing hypersusceptibility to certain common chemicals in industry have implications far beyond the limits of the workspace. They have important meaning for the entire field of medical genetics, for red blood cell research, for determining drug sensitivity, and so forth. In due time, they could reach into the office of the private practicing physician for general application.

"This can be done, however, only as there is more communication and a greater interplay between occupational health and the preventive health practitioners outside the plant, with medical research at large and others with whom research and practice are allied. Let us not make the mistake of isolating occupational health outside the mainstream of American health protection.

"In that connection, let me urge that occupational health broaden its scope and raise its sights to make itself part of the dynamic movement we call environmental health. . . .

"Occupational health, with its vast experience and know-how, can be a central force in stimulating a unified attack on those hazards. There is a readiness, I believe, to undertake much more extensive and sophisticated research on the environment than ever before. There is a realization that the laboratory equipment and the techniques for conducting this research will have to be much more refined and expensive and complex than any we have yet known.

"Also, we must find out just what part occupation plays in aggravating certain diseases that are common to the adult population. It may well be that the combination of breathing smog, smoking cigarettes, and working in a particular occupational environment, will have a unique and damaging effect on certain workers. One could choose other examples, using different combinations of drugs, cosmetics, food

additives, insecticides, radioactivity, and other pollutants of the environment to which we are all exposed, to different extents, in our daily lives.

"Whereas in earlier days, concern over an occupational health hazard was likely to develop only after deaths or serious and obvious illness occurred in sufficient numbers to bring the problem dramatically to public attention, we cannot afford to rely on such an approach today. The new factors, frequently introduced first into the work environment and later into everyone's environment, are too potent, the effects are too subtle, and the consequences too grave and irreversible permit gambling on prolonged exposures.

"Congress has just recognized this principle in passing the Clean Air Act, to fight smog and other community air pollution. We are also giving serious and continuous attention to the water supply of the Nation and to control of water pollution. Radiological health protection always finds a receptive audience.

"Now someone needs to speak up for industrial hygiene. You know that the worker is the one who experiences 'first exposure' to many of the ingredients that later become the big commonplace environmental health problems of the total population. We see, in the pesticides area for example, how knowledge gained from study and protection of the workers manufacturing, transporting, and applying these chemical poisons gives valuable assistance in protecting, or reassuring, the public, now that pesticides are found in the general environment.

"We need to impress upon people who do not know this fact of life that the occupational environment is the best place, often the only place, to study human exposure to certain chemicals, stresses, heat, fatigue, and other health-affecting factors.

"Protecting the worker from new health hazards can redound to the benefit and protection of us all. This is the message we need to get before the Nation so that we will be permitted and authorized to do the kinds of studies and undertake the kind of activity we know should be done. We would be doing our country a great service by awakening its conscience once again to the urgent needs of the workplace.

"Because we have eliminated the worst of the abuses which characterized the early days of unlimited hours, child labor, sweat shops, and the absence of legal protection for workers—and because America is superior in so many areas of technology and commerce—there appears to be a general assumption that we have mastered the big problems of occupational health. Actually our unsolved problems are many. . . .

"We can look back upon a half century, and more, of work well done in industrial hygiene. We have learned a great deal and most of us have a fairly clear idea of what still needs to be done. The present challenge to us, as a nation, is to put to use—on behalf of workers'

health—all that we now know. This is not being done to the fullest extent possible.

"We must carry our work forward at an increased pace, commensurate with the gravity and importance of the task.

"So, let us begin."

SECTION 5

Occupational Health and the Community

In an article published in the March 1960 issue of the A.M.A. Archives of Industrial Health, Dr. Leroy E. Burney, then Surgeon General, U.S. Public Health Service, described in detail the growing interdependence of the industrial and the community environment. The following paragraphs are an abbreviation of his article.

"During the past decade the American people have expressed their mounting concern about the environment and health. They do not state their concern in those broad terms. Instead they direct anxious questions and protests to their physicians, legislators, and government officials on such concrete subjects as radiation, air pollution, water pollution, sanitation, and other conditions clearly associated with environment.

"In the first 100 years of our Nation, American industry was founded, railroads were built to span the country, steamboats to ply the oceans and inland waters, the population increased more than tenfold. Yet our economy remained primarily agricultural. A second period of rapid technologic change—from about 1890 to 1940—was accompanied by increased concentration in the growth of cities. For the past 20 years the rate of urbanization has also accelerated. Approximately three-fifths of the present population resides in metropolitan areas where industry, commerce, finance, scientific and higher educational institutions, major medical centers, and cultural institutions also are concentrated. Hence, it is obvious that for some time to come, both our principal health problems and our resources for their solution will be concentrated in metropolitan industrial communities.

"Technological innovation influences all aspects of man's environment—physical, biological, and social. The impact may be directly beneficial to human health, as when modern methods of processing and refrigeration made possible the preservation and distribution of a wide variety of nutritious foods. Technological change may adversely affect the health and safety of vulnerable groups in the population, as when deep-shaft mining became possible, but for several hundred years men did not learn to recognize and cope with the hazards of dust in miners' lungs. Or an innovation may operate in intricate ways both to reduce and to increase man's risks to life and health.

"In the long perspective, however, technologic change, itself, does not bring the blessing or the bane. It is how men use their science and technology that determines both immediate and long-range effects. . . .

Time-Scales of Change

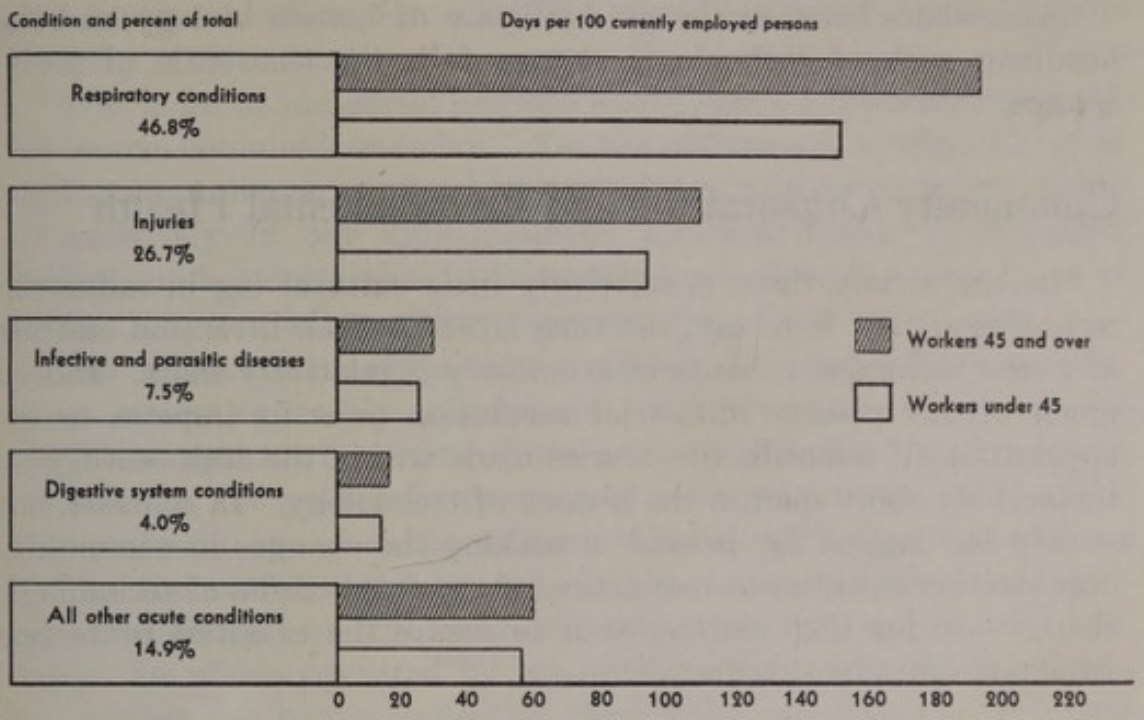
"The fact of change is the one unchanging fact of human life, whether we mean the life of an individual or the life of a community. The hazard for our industrial civilization is that in our enthusiasm for its dynamic power, we may ignore the differences in the time-scale of change in human biology, industrial technology, and social organization. The core of our environmental health problem today and in the future is how to bring these strikingly different time-scales into a balance that will give our human communities some assurance of a better life and greater health protection in a period of rapid technologic change.

"Physicians, as biologists, know that in man they are dealing with an organism which has not changed perceptibly in fundamental structure and physiology throughout the 10,000 to 20,000 years of observable record. . . .

"Except in a very few instances, such as exposure to radiation, possibly also to viruses, and certain chemicals, we have no scientific knowledge of what may start a mutation. Persons can be overwhelmed swiftly by lethal exposures to micro-organisms, chemicals, radiation, mechanical trauma, and other environmental factors. These accidents, however, have not altered the slow time-scale of biological change in man.

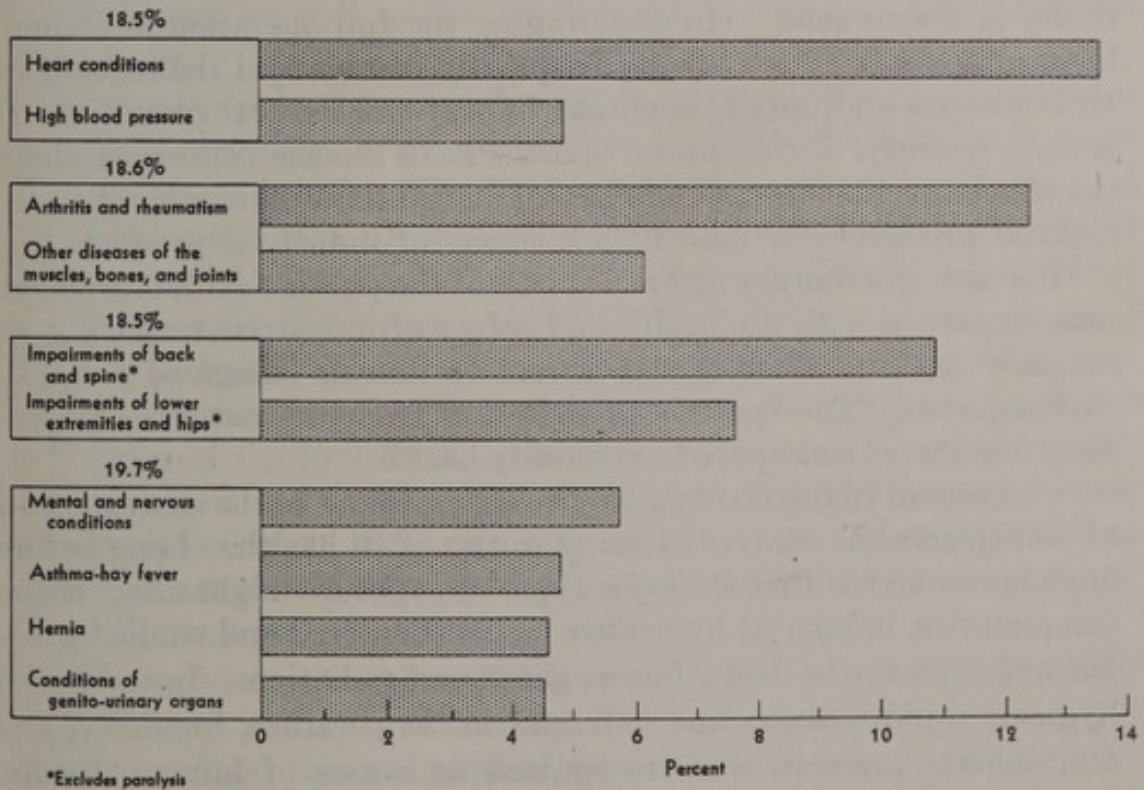
"In sharp contrast, the time-scale of technologic change has accelerated beyond the average man's comprehension. Partington has observed, for example, that there were very few additions to man's knowledge and use of materials for a period of about 3,000 years (from the end of the Bronze Age to the emergence of modern science from the Medieval period). In this second half of the 20th century, entirely new chemicals are being introduced into American industry at the

Figure 7. Respiratory Conditions are the Major Cause of Work Loss Associated With Acute Conditions



Source: U.S. Public Health Service, Division of Occupational Health. Based on National Health Survey data for survey year July 1962–June 1963.

Figure 8. Seventy-five Percent of the Usually Working Persons With Activity Limitations Due to Chronic Disease Are Estimated in 10 Disease Groups: National Health Interview Surveys, June 1959–July 1961



Source: U.S. Public Health Service, Division of Occupational Health, Employee Health Programs Section. February 1965.

rate of 10,000 to 20,000 per year. Chemical production is increasing at a rate of about three times that of total industry.

"Somewhere between the gradual pace of human biology and the headlong rush of technologic change falls the time-scale of social change. . . .

Community Organization and Environmental Health

"In our society there is relatively little cultural lag in industrial technology; that is to say, the time lapse between invention and use of a new technique in American industry is relatively short. Indeed much of our present industrial revolution owes its impetus to the application of scientific discoveries made within the 20th century—a remarkably short span in the history of technology. In contrast, our society has lagged far behind in making the changes in community organization essential to realization of the full benefits of technologic change—or for that matter, even to assure the essential protection from possibly adverse effects. . . .

Industrial and Community Health

"It is obvious to all of us that there is a disparity between our capacities to create a healthful environment and our social skills to accomplish this purpose. Underlying this paradoxical situation is the American heritage. Our society has been created on a basis of opportunity and abundance. In encouraging the full operation of technologic progress, we have all too frequently disregarded the inroads of an industrial civilization upon our human and natural resources. It is only recently, for example, that we have become concerned about the effects on human communities of harmful substances used in industrial processes—or used by consumers of industrial products.

"For nearly a century after the birth of the public health movement, men concerned with the health and safety of industrial workers were the only ones to recognize the threat to human beings of *artificial environments*. The hazards of infection from the natural environment dominated concepts of community health.

"Pioneers of industrial hygiene, however, found in the environments of workplaces the sources of many causes of ill health. Long before anyone considered that the same types of exposure might affect entire communities, industrial hygienists had encountered and studied problems of exposure to dusts, fumes, gases, and radiation. In industrial hygiene, rapid changes and extremes in temperature, humidity, and atmospheric pressure were recognized as causes of human disease. Glare, poor illumination, noise, vibration, mechanical failures: all came under the scrutiny of industrial hygienists as factors in the

working environment affecting the health and efficiency of workers. Prolonged fatigue and tension, posture, clothing, and many other factors became matters for scientific investigation of health in the working environment.

"This store of industrial hygiene knowledge has peculiar relevance for human communities today. For the problems of artificial environments are no longer confined to workplaces. As all of us try to live competitively in our multichemical, air-conditioned, jet-propelled, traffic-bound, industrialized environment, we share the same types of exposure as our fellow citizens experience in their workplaces.

"Our urban communities today could qualify as artificial environments almost as readily as industrial establishments. There are two notable exceptions, however. First, except for the hazard of mechanical injuries, the potential exposures to toxic substances, noise, vibration, and so on are much more intensive in the workplace than at home and in the community. Second, industry spends billions to eliminate or effectively control hazardous exposures in the working environment. In plants operated by responsible, well-organized industries, the worker has better protection than in his community. I do not know of a single one of our urban communities where environmental controls for the protection of the general population measure up in scope and quality to those maintained by the majority of our larger industrial establishments. . . . Frequently, the sources of community environmental hazards are the industries which protect the worker from occupational exposures and upon which he depends for a means of livelihood as well as for the material benefits of our American technology.

"From the point of view of a physician, it is difficult not to see an inevitable merging of the problems of industrial health with those of community health. The logic of this observation could be based on a demonstration of the relationships of the three sides of our environmental triangle: biology, technology, and social organization.

"In the causation of such major chronic diseases as cancer, heart disease, arthritis, and metabolic disease, medical research is increasingly demonstrating that these conditions are the product of intricate responses of the individual to numerous factors in his environment, both physical and social. In the causation of lung cancer, for example, an association with cigarette smoking has been demonstrated. Yet it is not an exclusive association. There are many occupational exposures associated with lung cancer. . . .

"It seems to me that the significance of such intricate relationships for industry and the community is that the solution of our major health problem lies in a joint attack based upon a pooling of knowledge concerning the environmental factors associated with disease. The time has passed, I believe, when we can hope for a reduction in

the human and economic burdens of disease and injury through separate approaches to 'occupational disease,' on the one hand, and 'general disease,' on the other. . . .

"I am confident that American science and technology will invent methods for solving present and future problems of environmental health which will be more efficient and more effective than any we possess today. The time has long since passed, however, when industry or the community might profit from waiting for new methods. If we pool our knowledge and work out satisfactory arrangements for its application, our communities and industries will be ready for the great new age just ahead.

Industry's Stake in a Common Approach

"American industry has an important economic stake in such a common approach. The trend has been well established for management to bear all or part of the costs of illness among workers, be it of occupational or nonoccupational origin. The striking fact is that health insurance programs, made available and paid for through the workers' place of employment, cover more than 37 million employees and their 57 million dependents. This means that a large share of the Nation's multibillion dollar expenditures for hospital and medical care is financed through employees' health plans. Certainly, anything that can be done to reduce the risks of illness in the community and in the work place should significantly reduce the costs of insurance.

"It has been justly observed that 'occupational disease' is not a pathological entity but a legal term. As science learns more and more about the multiple causation of chronic disease, it is likely that occupational and nonoccupational factors, hitherto unsuspected, will be identified. High standards of industrial hygiene will become increasingly important, not only as a means of preventing occupational exposure but also indirectly as a means of reducing the overall costs of illness.

"Similarly, industry and government have a joint responsibility for creating healthful communities. American industry is increasingly recognizing its new role of corporate citizenship in our changing patterns of community life. Mr. Cleo Craig, chairman of the board of A.T. & T., said a year or two ago: 'No one can accept responsibility in the world unless he first takes it on his doorstep. So for us in industry, I can see only one course to follow. Call it commonsense, call it policy, call it anything you like. To my mind, industry must aim for, exist for, and everlastingly operate for, the good of the community.'"

"This thoughtful statement places industry and government in a cooperative relationship which, I believe, is destined to insure for

the American people not only the higher standards of living which industrial development has given them but also higher levels of health and community life. . . . The roles of industries and governmental agencies differ, but, in my experience, cooperative relationships between their representatives increase the opportunities of both for service to the community.

Public Health Service Role in Industrial and Community Health

"As most of you know, the Service's Occupational Health Program, with its laboratory at Cincinnati, Ohio, is the modern metamorphosis of an industrial hygiene research program authorized by Congress nearly 50 years ago. For many years, our industrial hygienists played a major role in epidemiological, clinical, and laboratory studies undertaken at the request of and in cooperation with numerous industries. The status of industrial hygiene has changed over the years. Industrial medicine has grown, and a much higher proportion of our industries now have their own industrial hygienists to undertake the studies essential for the preliminary and clinical evaluation of new materials and processes.

"We still regard the conduct of long-term, epidemiological studies involving industry-wide problems as our major role in the field of industrial hygiene. The costs of such studies, like the costs of industrial development, have soared, however. . . .

"Although many corporations can finance their own research, there are situations in which it is impossible for one establishment to accumulate the information it needs on a given occupational health problem. The same problem and the same difficulty of solution may exist in other parts of the industry. It is in such situations that the Public Health Service might play a decisive role as an impartial scientific investigator for the industry as a whole. For example, at the present time, we are conducting a study of silicosis in metal miners, and we are learning many significant new facts about this old problem.

"The major part of our appropriations and our effort is devoted to backing up State industrial hygiene programs. This, of course, is consistent with the fact that State and local governments have the legal responsibility for industrial hygiene standards and regulations.

"Several other operating programs of the Public Health Service are closely related to industrial hygiene and problems of environmental health involving industry. Radiological health, water-polution control, air pollution, and sanitary engineering research fall in this category, while the research and training programs of our National Institutes of Health are augmenting the Nation's total scientific effort in the medical and related sciences. . . ."

The year following the publication of Dr. Burney's article, Congress passed the Community Health Services Act of 1961. This act, which gives financial assistance to programs and facilities providing out-of-hospital services for the chronically ill and the aged, can have considerable significance for both employers and employees. In time, the workplace can become a way in which to reach persons in need of care.

The programs receiving assistance under the act are now concentrating on care for those who are chronically ill. Eventually, however, these programs may apply methods of preventing chronic illness, otherwise their task may become overwhelming. Periodic health appraisals, health education, and other preventive services will become extremely important and cooperation with the workplace will facilitate such activities. The emphasis which the act places on restorative services and rehabilitation centers also indicates a great need for promoting cooperation between the persons and facilities providing services and industrial and labor groups within the communities.

Economic Considerations

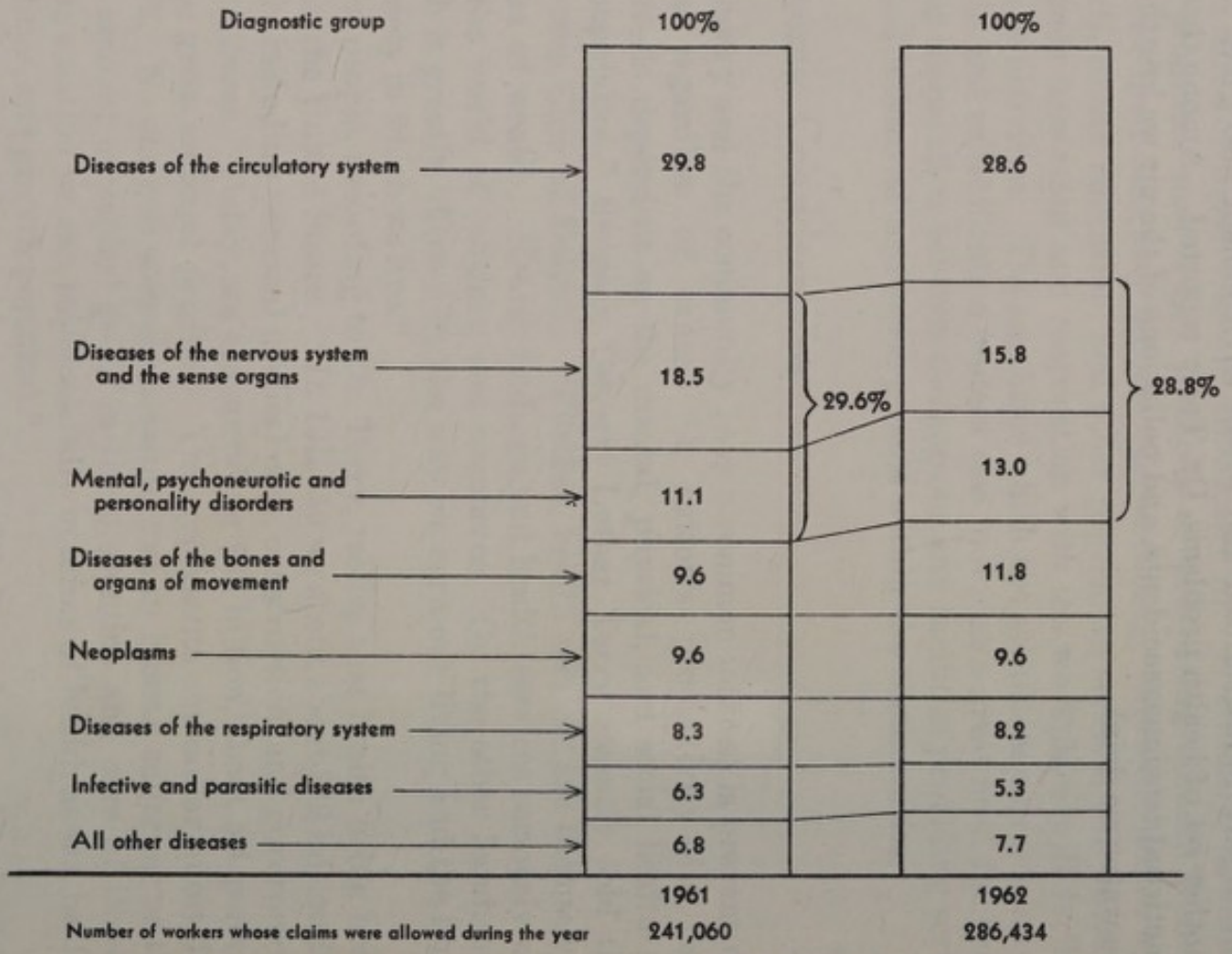
Industry and the community have a common interest is preventing illness regardless of cause. "A nation's productivity—its real wealth—is dependent on the mental, physical, and social health of the population," Surgeon General Luther Terry recently told the Economic Club of Detroit. "Further, health services are themselves a form of wealth. Health findings and health services seriously affect the world of industry and commerce. On the other hand, our health is greatly affected by the way we earn our living and the kind of society in which we live."

Few people, according to Dr. Terry, realize that health is big business in the United States. "In 1949–50 we spent about $12 billion for health, including personal medical care, construction, and government expenditures. Today, we are spending $33 billion, about 5.4 percent of the gross national product. This represents our dollar effort for health. No one can actually measure cost in human suffering or the total amount of capital gains in the prevention and cure of illness. But as a nation we can think usefully in terms of health assets, health liabilities, and growth potential."

The control of known industrial health hazards was described by Dr. Terry as a striking economic gain in the health field. The saving in productivity and compensation costs as a result of health and safety services in industry was reported to be incalculable. But the total burden of ill health remains high, Dr. Terry stated. "A number of infectious diseases have virtually disappeared in the United States, and the cost of these diseases has declined correspondingly. In the same period, however, losses of production from other diseases as

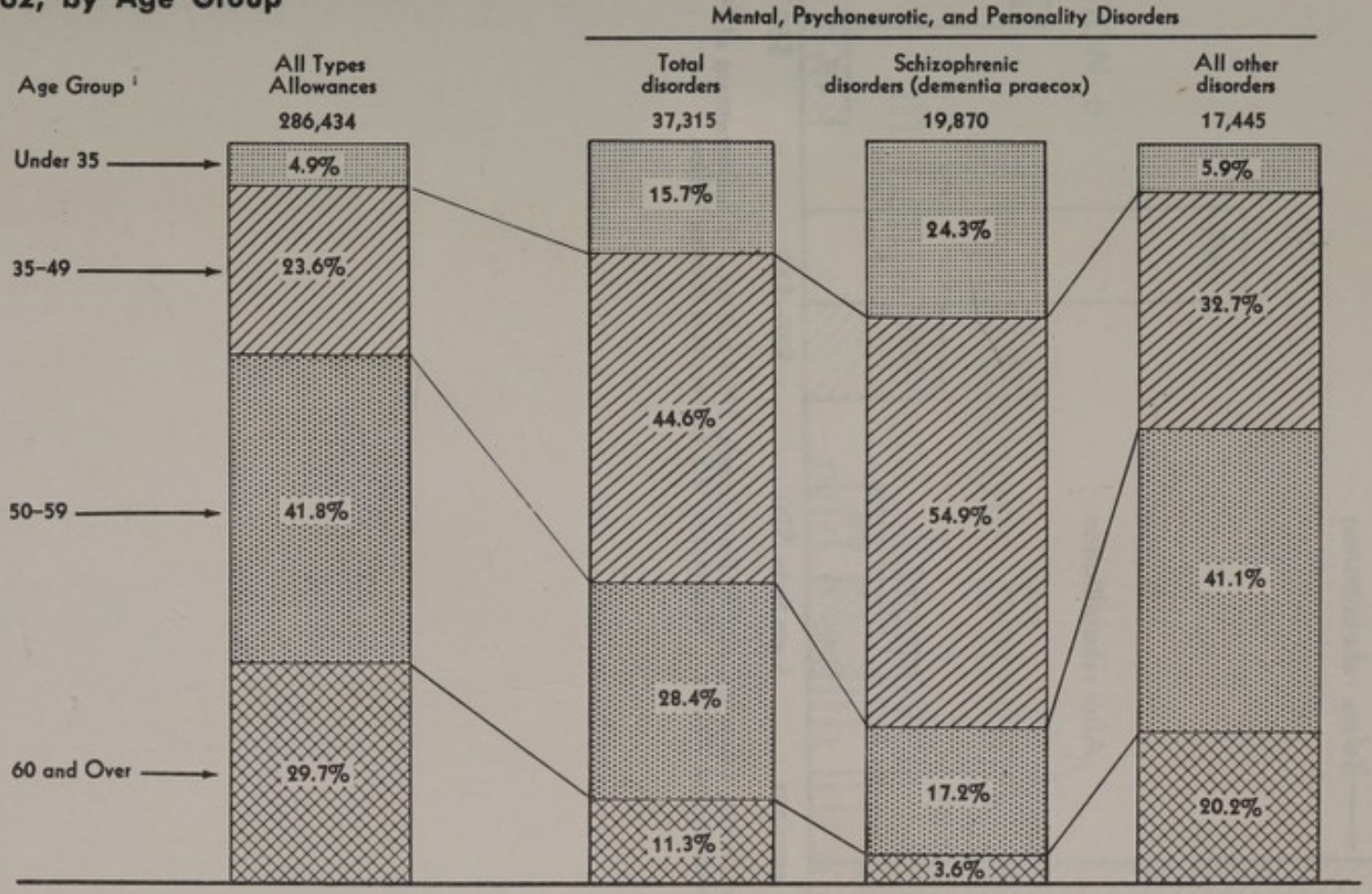
well as the costs of care have soared astronomically. In a sense, the economic burden the Nation once carried as a result of diseases now under control has been shifted to other causes of ill health—and it has increased. Today the major killers and cripplers are the chronic diseases, such as heart disease and cancer, afflictions which mostly take their toll later in life. In 1960, for example, there were 14 times as many deaths from chronic noninfectious as from infectious diseases." Our highly industrialized and urban environment also gives rise to another set of health problems, Dr. Terry reported. Among these are emotional tensions, accidents, and pollutions of the air we breathe and the water we drink.

Figure 9. Percentage Distribution of Disability Allowances Made to Workers Under the Old-Age, Survivors, and Disability Insurance Program in 1961 and 1962, by Diagnostic Group



Source: *Disability Applicants Under the Old-Age, Survivors, and Disability Insurance Program.* U.S. Department of Health, Education, and Welfare, Social Security Administration, March 1963, and April 1964.

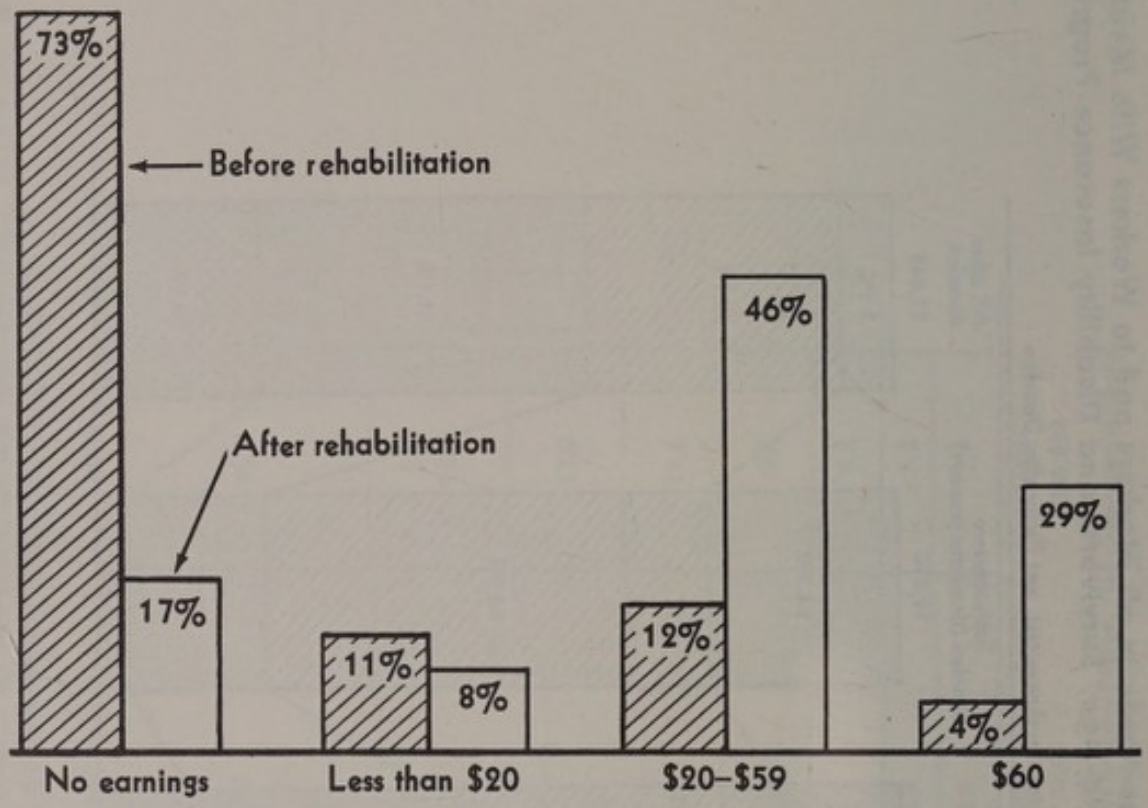
Figure 10. Percentage Distribution of Disability Allowances Made to all Workers and to Workers With Mental, Psychoneurotic and Personality Disorders Under the Old-Age, Survivors, and Disability Insurance Program in 1962, by Age Group



[1] Age on birthday 1962

Source: *Disability Applicants Under the Old-Age, Survivors, and Disability Insurance Program.* U.S. Department of Health, Education, and Welfare, Social Security Administration, April 1964.

Figure 11. Weekly Earnings Before and After Rehabilitation of Persons Rehabilitated in Fiscal Year 1963



Source: *Health, Education, and Welfare Trends,* 1964 Edition. U.S. Department of Health, Education, and Welfare. Washington, U.S. Government Printing Office.

SECTION 6

Tabulations Showing Trend in Employment, Employee Health and Health Benefits

Table 1. Employment status of the noninstitutional population, by sex: United States, 1940 and 1964

Item	Thousands of persons 14 years old and over					
	1964 [1]			1940		
	Total	Male	Female	Total	Male	Female
Total noninstitutional population	133,519	64,781	68,738	100,380	50,080	50,300
Total labor force, including Armed Forces	75,553	50,123	25,430	56,180	42,020	14,160
Civilian labor force, total	72,810	47,411	25,399	55,640	41,480	14,160
Employed, total	68,517	44,730	23,786	47,520	35,550	11,970
Agriculture	4,017	3,432	585	9,540	8,450	1,090
Nonagricultural	64,500	41,299	23,201	37,980	27,100	10,880
Unemployed	4,293	2,681	1,613	8,120	5,930	2,190
Not in labor force	57,965	14,658	43,308	44,200	8,060	36,140

[1] Figures as of March 1964.

Source: U.S. Department of Commerce, Bureau of the Census. *Statistical Abstract of the United States, 1964.* Washington, U.S. Government Printing Office, 1964. p. 216.

Table 2. Number and percent distribution of employees in nonagricultural establishments, by industry: United States, 1950, 1960, and 1963

Type of industry	Number (in thousands)			Percent distribution		
	1950	1960	1963	1950	1960	1963
Total	45,222	54,370	57,174	100.0	100.0	100.0
Mining	901	712	634	2.0	1.3	1.1
Contract construction	2,333	2,885	3,029	5.2	5.3	5.3
Manufacturing	15,241	16,796	17,035	33.7	30.9	29.8
Durable goods	8,094	9,459	9,659	17.9	17.4	16.9
Nondurable goods	7,147	7,336	7,376	15.8	13.5	12.9
Transportation and public utilities	4,034	4,004	3,913	8.9	7.4	6.8
Wholesale and retail trade	9,386	11,391	11,865	20.8	20.9	20.8
Finance, insurance and real estate	1,919	2,669	2,866	4.2	4.9	5.0
Service and miscellaneous	5,382	7,392	8,297	11.9	13.6	14.5
Government	6,026	8,520	9,535	13.3	15.7	16.7
Federal	1,928	2,270	2,358	4.3	4.2	4.2
State and local	4,098	6,250	7,177	9.0	11.5	12.5

Source: U.S. Department of Commerce, Bureau of the Census. *Statistical Abstract of the United States, 1964.* Washington, U.S. Government Printing Office, 1964. p. 221.

Table 3. Years of school completed, for persons 20 years old and over who worked in 1959, by sex and extent of education: United States

Years of school completed [1]	All persons who worked in 1959		Persons who worked 50 to 52 weeks	
	Number (in thousands)	Percent	Number (in thousands)	Percent
Male				
Total	46,284	100.0	31,908	100.0
No school years completed	597	1.3	277	.9
Elementary:				
1 to 7 years	8,073	17.4	4,492	14.1
8 years	7,326	15.8	4,756	14.9
High school:				
1 to 3 years	9,314	20.1	6,409	20.1
4 years	11,441	24.7	8,874	27.8
College:				
1 to 3 years	4,806	10.4	3,438	10.8
4 or more years	4,727	10.2	3,662	11.5

Female				
Total	24,296	100.0	10,918	100.0
No school years completed	185	.7	67	.6
Elementary:				
1 to 7 years	3,053	12.6	1,193	10.9
8 years	3,176	13.1	1,399	12.8
High school:				
1 to 3 years	5,018	20.6	2,168	19.9
4 years	8,004	32.9	4,134	37.9
College:				
1 to 3 years	2,864	11.8	1,275	11.7
4 or more years	1,995	8.2	682	6.3

[1] Based on a 5-percent sample.

Source: U.S. Department of Commerce, Bureau of the Census. *U.S. Census of Population, 1960.* Washington, U.S. Government Printing Office, 1963.

Table 4. Employment in establishments reporting under the Old-Age, Survivors, and Disability Insurance program, by size of reporting unit, 1962 and 1953

Size of reporting unit	Employees [1]				Reporting units [3]			
	1962		1953		1962		1953	
	Number (in thousands)	Percent	Number (in thousands)	Percent	Number	Percent	Number	Percent
Total.....	[2] 43,512	100.0	39,574	100.0	3,347,647	100.0	2,909,537	100.0
Less than 50....	16,100	37.0	14,593	36.9	3,225,669	96.4	2,801,813	96.3
50–99.....	3,500	8.0	3,839	9.7	64,780	1.9	57,123	2.0
100–249.....	5,200	12.0	4,953	12.5	36,850	1.1	32,240	1.1
250–499.....	3,900	9.0	3,618	9.1	11,822	.4	10,307	.4
500 or more....	14,800	34.0	12,571	31.8	8,526	.3	8,054	.3

[1] Excludes self-employed and workers not under the program (primarily agricultural workers, employees of Federal, State, and local governments and railroads).

[2] A breakdown of employment according to size of reporting unit was not available and has been estimated for this table on the basis of employment previously reported and the percent increase in number of units 1953 to 1962. The total is the actual number of employees reported for pay period mid-March 1962, as reported in *County Business Patterns.*

[3] A reporting unit is generally a single establishment or group of similar establishments of an employer.

Source: Based on U.S. Department of Commerce, and U.S. Department of Health, Education, and Welfare, *County Business Patterns.* Washington, U.S. Government Printing Office, 1962.

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Table 5. Women employed in major industries: United States, 1940, 1950, and 1964

Industrial group (ranked by number of women employees in 1964)	Number (in thousands) 1964	Percent distribution			Percent of all workers		
		1964	1950	1940	1964	1950	1940
Total	23,786	100	100	100	35	29	26
Services	10,128	43	36	45	60	55	59
Professional and related	5,700	24	16	17	60	55	57
Personal	3,839	16	18	26	75	71	73
Business	426	2	1	1	23	13	10
Entertainment and recreation	163	1	1	1	29	24	21
Manufacturing	4,667	20	23	21	26	25	23
Retail trade	4,327	18	20	17	41	36	31
Finance, insurance, real estate	1,551	7	5	4	47	43	33
Public administration	1,048	4	4	3	28	25	20
Transportation, communications	753	3	4	3	16	15	12
Agriculture	597	3	4	5	15	10	6
Wholesale trade	473	2	3	2	20	19	16
Construction	217	1	[1]	[1]	5	2	2
Mining	25	[1]	[1]	[1]	5	2	1

[1] Less than 0.5 percent.

Source: U.S. Department of Commerce, Bureau of the Census. *Current Population Reports, Series P–60.* (Prepared by the Women's Bureau, U.S. Department of Labor.)

Table 6. Number of work-loss days due to illness and injury among the currently employed and work-loss days per currently employed person, by sex and age: United States, specified years, July 1959–June 1962

Sex and age	Number of work-loss days 1959–60 (in millions)	Work-loss days per currently employed person [1]			
		1959–60	1960–61	1961–62	3-year average
Male					
All ages	244.4	5.5	5.3	5.7	5.5
17–24	18.9	3.3	3.4	3.1	3.3
25–44	94.0	4.2	4.3	4.6	4.5
45–64	107.0	6.8	6.8	7.8	7.1
65 and over	24.5	11.0	9.8	9.4	10.0
Female					
All ages	125.5	5.6	5.6	5.8	5.7
17–24	17.9	4.4	4.1	4.4	4.3
25–44	51.2	5.5	5.6	6.0	5.7
45–64	49.3	6.2	6.1	6.4	6.2
65 and over	7.2	7.4	7.8	4.6	6.6

[1] A day is counted as *lost from work* if the person would have been going to work at a job or business that day but instead lost the entire workday because of an illness or an injury. If the person's regular work is less than a whole day and the entire work day was lost, it would be counted as a whole workday lost. *Currently employed* persons are all persons 17 years of age or over who reported that at any time during the 2-week period covered by the interview they either worked at or had a job or business. *Usually working* persons includes persons 17 years of age or older whose usual status was working during the 12-month period.

Source: U.S. Department of Health, Education, and Welfare, Public Health Service, National Center for Health Statistics Publications (Series C, No. 7, and others). Washington, U.S. Government Printing Office, 1962 and 1963.

Table 7. Estimated annual workdays lost because of illness and injury and loss to employers in terms of employee earnings, according to size of establishment

Item	Estimated work days lost	Estimated loss to employer in employee earnings [3]
Total loss, all currently employed persons	370,000,000	$7,800,000,000
Average loss per currently employed person	[1] 5.6	[2] 119
Estimated loss in establishments of specified size (employees):		
100	560	11,900
250	1,400	29,750
1,000	5,600	119,000
2,500	14,000	297,500
5,000	28,000	595,000
7,500	42,000	892,500
10,000	56,000	1,190,000
15,000	84,000	1,785,000

[1] Based on National Health Survey figures for a 3-year period.

[2] Based on average annual earnings of $5,190 per full-time employee in 1963 and an average of 245 workdays per year.

[3] Only the direct loss to employers is reflected in employee earnings. The indirect costs are more difficult to estimate but are estimated by some to result in 1½ times employee earnings. This indirect loss results from such things as shifting workers to cover the work usually performed by the absentee, the delay resulting when the work of the absentee affects the work of others, etc.

Source: U.S. Department of Health, Education, and Welfare, Public Health Service, Division of Occupational Health.

Table 8. Number of work-loss days due to illness and injury and days per currently employed person per year, by family income, sex and age: United States, July 1959–June 1960

Sex and age	Total days lost (in millions)	Family income					
		All incomes	Under $2,000	$2,000–$3,999	$4,000–$6,999	$7,000+	Unknown
		Number of days per currently employed person [1]					
Male							
All ages 17+	244.4	5.5	9.8	6.4	4.5	4.9	5.7
17–24	18.9	3.3	5.9	2.7	2.5	3.0	5.3
25–34	40.6	4.1	5.6	5.1	3.4	3.9	4.6
35–44	53.4	5.0	9.2	5.5	4.9	4.4	3.9
45–54	55.3	5.9	10.5	6.5	5.0	5.7	5.5
55–64	51.7	8.1	12.2	11.0	7.1	6.1	7.5
65 and over	24.5	11.0	18.5	12.4	4.0	9.1	10.2
Female							
All ages 17+	125.5	5.6	6.5	6.6	5.4	4.9	4.5
17–24	17.9	4.4	3.5	5.2	3.5	5.7	3.8
25–34	22.3	5.5	7.7	7.3	5.2	3.9	5.1
35–44	28.9	5.4	5.6	7.1	5.4	4.5	5.5
45–54	31.9	6.4	7.4	7.6	7.2	5.1	2.8
55–64	17.4	6.0	7.4	5.5	5.4	6.1	6.3
65 and over	7.2	7.4	8.3	5.8	8.9	6.9	5.1

[1] For definitions of work loss and current employment, see table 6.

Source: U.S. Department of Health, Education, and Welfare, Public Health Service, National Center for Health Statistics. *Currently Employed Persons, Illness and Work-Loss Days (Series C, No. 7).* Washington, U.S. Government Printing Office, 1962.

Table 9. Number of days lost from work per 100 currently employed persons, because of acute conditions, by type of condition and sex: United States, specified years, July 1959–June 1964

Acute condition	Number of workdays lost per 100 currently employed persons [1]				
	1959–60	1961–62	1962–63	1963–64	4-year average
Male					
All acute conditions	342.6	330.7	355.7	323.1	338.0
Infective and parasitic diseases	26.1	26.1	24.0	23.9	25.0
Respiratory conditions	160.4	134.3	156.0	123.2	143.6
Digestive system conditions	30.0	19.9	15.2	20.2	21.3
Injuries	89.5	119.0	121.4	123.0	113.2
All other acute conditions	36.6	31.3	39.0	32.8	34.9
Female					
All acute conditions	404.1	365.2	436.0	329.8	383.8
Infective and parasitic diseases	25.6	37.8	37.7	40.2	35.3
Respiratory conditions	211.1	175.9	224.2	127.2	184.6
Digestive system conditions	19.0	26.1	16.0	12.4	18.4
Injuries	89.5	56.7	66.2	77.8	72.5
All other acute conditions	59.0	68.8	91.9	72.1	73.0

[1] For definitions of work loss and current employment, see table 6. An acute condition is defined as one which has lasted less than 3 months and has involved either medical attention or restricted activity.

Source: U.S. Department of Health, Education, and Welfare, Public Health Service. *National Center for Health Statistics Publications (Series C, No. 7 and others).* Washington, U.S. Government Printing Office, 1962, 1963 and 1964.

Table 10. Number of work-loss days associated with chronic conditions, work-loss days per 1,000 currently employed persons per year, and average number of currently employed persons absent from work each day because of the conditions for selected chronic conditions by sex: United States, July 1959–June 1960

Selected chronic conditions	Work-loss days [1]						
	Number in thousands	Days per 1,000 currently employed persons per year			Average number of currently employed persons absent from work each day because of the conditions (work-loss days/245, in thousands)		
	Both sexes	Both sexes	Male	Female	Both sexes	Male	Female
Heart conditions	15,323	230.5	290.3	112.1	63	52	10
High blood pressure	7,327	110.2	87.4	155.5	30	16	14
Varicose veins	1,973	29.7	17.3	54.2	8	3	5
Hemorrhoids	5,518	83.0	83.6	81.8	23	15	7
Other conditions of circulatory system	4,262	64.1	63.7	65.0	17	11	6
Chronic sinusitis	5,003	75.3	71.4	83.0	20	13	8
Chronic bronchitis	3,512	52.8	67.1	24.6	14	12	2
Other conditions of respiratory system	3,753	56.5	66.9	35.8	15	12	3
Tuberculosis, all forms	205	3.1	4.6	(*)	1	1	(*)
Other infective and parasitic diseases	2,546	38.3	32.6	49.6	10	6	5
Headache and migraine	1,718	25.8	17.6	42.2	7	3	4

Peptic ulcer	10,295	154.9	188.3	88.7	42	34	8
Hernia	6,503	97.8	138.2	18.0	27	25	2
Disease of gallbladder	2,519	37.9	40.3	33.2	10	7	3
Other conditions of digestive system	8,673	130.5	146.1	99.6	35	26	9
Menstrual disorders	1,274	19.2	.....	57.1	5	.....	5
Menopausal disorders	888	13.4	.....	39.8	4	.....	4
Other conditions of genito-urinary system	12,555	188.9	150.8	264.3	51	27	24
Skin conditions	3,347	50.4	22.8	104.8	14	4	10
Anemia and related conditions	436	6.6	(*)	18.0	2	(*)	2
Asthma-hay fever	9,427	141.8	147.3	131.0	38	27	12
All other allergies	245	3.7	3.9	(*)	1	1	(*)
Goiter and other thyroid conditions	936	14.1	(*)	38.7	4	(*)	4
Diabetes	2,180	32.8	42.8	13.0	9	8	1
Mental and nervous conditions	9,769	147.0	168.1	105.1	40	30	10
Residuals of fractures and dislocations	3,158	47.5	55.9	31.0	13	10	3
Arthritis and rheumatism	12,108	182.1	199.0	148.7	49	36	14
Other diseases of muscles and joints	8,929	134.3	173.6	56.6	36	31	5
Orthopedic impairments	17,416	262.0	311.7	163.6	71	56	15
All other chronic conditions	33,924	510.3	511.7	507.5	138	92	46

[1] For definitions of work loss and current employment, see table 6.

* Magnitude of the sampling error precludes showing separate estimates.

Source: U.S. Department of Health, Education, and Welfare, Public Health Service, National Center for Health Statistics. *Currently Employed Persons, Illness and Work-Loss Days, United States, July 1959–June 1960 (Series C, No. 7).* Washington, U.S. Government Printing Office, 1962.

Table 11. Restricted-activity and bed-disability [1] days among usually working persons by type of disability, sex, and age: United States, July 1959–June 1960

Sex and age	Number of days (millions)		Number of days per person per year	
	Restricted activity	Bed disability	Restricted activity	Bed disability
Male				
All ages 17+	502.3	171.9	11.8	4.0
17–24	31.9	12.1	7.2	2.7
25–44	198.9	72.7	9.6	3.5
45–64	220.0	75.2	14.1	4.8
65–74	41.6	9.5	24.8	5.7
75 and over	9.9	2.3	27.6	6.5
Female				
All ages 17+	265.2	92.8	14.2	5.0
17–24	37.8	16.4	11.8	5.1
25–44	105.0	36.8	13.4	4.7
45–64	106.9	35.5	15.5	5.1
65–74	14.3	3.6	23.5	5.8
75 and over	(*)	(*)	(*)	(*)

[1] A day of restricted activity was one in which a person cut down on his usual day-to-day activities because of an illness or injury; included in this count were days spent in bed or days lost from work. A person was considered to have had a day of bed disability if he spent all or most of the day (more than half of the daylight hours) in bed because of an illness or injury. A day spent in the hospital was considered to be a day of bed disability, even though the person was not actually in bed. For a definition of usually working persons, see table 6.

* Magnitude of the sampling error precludes showing separate estimates.

Source: U.S. Department of Health, Education and Welfare, Public Health Service, National Center for Health Statistics. *Health Statistics, Disability Days, United States, July 1959–June 1960 (Series B, No. 29)*. Washington, U.S. Government Printing Office, 1961.

Table 12. Average annual number of persons injured [1] while at work and percent distribution by type of accident, according to place of accident: United States, July 1959–June 1961

Type of accident	Place of accident		
	Total	Industrial place	Other
Total persons injured: Number (in thousands)	8,896	5,996	2,900
Percent	100.0	100.0	100.0
Moving motor vehicle	3.6	.....	11.1
Nonmoving motor vehicle	4.5	4.7	4.1
Other work accidents	91.9	95.3	84.8
Machinery, in operation	8.8	9.4	7.6
Cutting or piercing instruments	9.5	9.0	10.4
Foreign body in eye, windpipe, or other oriface	5.8	6.2	5.1
Falls on stairs, step or from a height	5.6	5.0	6.9
All other falls	7.1	6.7	7.9
Bumped into object or person	5.6	4.0	8.8
Struck by moving object	15.0	18.3	8.2
Handled or stepped on rough objects	3.4	3.6	2.9
Caught in, pinched, or crushed 2 objects	4.7	4.5	5.0
Contact with hot object or open flame	3.4	3.8	2.6
One-time lifting or exertion	11.9	13.5	8.7
Twisted or stumbled	3.9	4.1	3.3
All other types of work accidents	7.3	7.3	7.4

[1] Includes only currently employed persons with work injuries involving 1 or more days of restricted activity or medical attention.

Source: U.S. Department of Health, Education and Welfare, Public Health Service, National Center for Health Statistics. *Persons Injured While at Work, United States, July 1959–June 1961 (Series B, No. 41).* Washington, U.S. Government Printing Office, 1963.

Table 13. Certificates of approval issued to industrial medical departments, specified years, 1932–64 [1]

Year	Accumulative total of approvals to 1951	Year	Accumulative total of approvals since 1951
1932	74	1960	363
1940	959	1964	406
1950	1,459		

[1] Prior to 1951 evaluations were made and certificates of approval were issued by the American College of Surgeons. Activities are now conducted by the Occupational Health Institute of the Industrial Medical Association. The wide concept of the institute's interest is reflected in the change in wording from "Certificates of Approval" to "Certificates of Health Maintenance."

Source: Based on Selleck, H. B., and Whittaker, A.H. *Occupational Health in America.* Detroit, Wayne State University Press, 1962, and unpublished data.

Table 14. Types of in-plant examinations and other services reported by physicians with primary medical responsibility for industrial medical programs in 585 plants.[1]

Type of service	Number of plants reporting	Percent distribution of replies			
		Total replies	Service provided to—		Not provided
			All employees	Special basis only	
Examinations:					
Preplacement	585	100.0	95.5	3.0	1.5
Chronic disease followup	585	100.0	58.5	28.0	13.5
Proctologic	584	100.0	10.0	37.0	53.0
Gynecologic	583	100.0	9.0	26.0	65.0
Attending-physician request	583	100.0	42.0	25.5	32.5
Employee request	582	100.0	54.0	22.0	24.0
Termination of employment	584	100.0	19.5	30.0	50.5
Other	585	100.0	8.0	5.5	86.5
Additional in-plant services:					
Health education	585	100.0	65.5	13.0	21.5
Counseling	584	100.0	77.0	11.0	12.0
Influenza immunization	583	100.0	47.0	25.0	28.0
Polio immunization	584	100.0	29.0	21.0	50.0
Other	585	100.0	9.5	16.5	74.0

[1] Information is based largely on 1961 records. The 585 programs studied covered over 3.6 million employees.

Source: Committee Report, Industrial Medical Association. *Journal of Occupational Medicine* 7:154–165 (April) 1965.

Table 15. Average annual cost of a medical department in industry, specified years, 1932–65 [1]

Year	Average per capita cost	
	Current dollars	Constant dollars 1957–59=100 [2]
1915	$0.88	2.40
1930	5.10	8.76
1940–41	5.46	11.19
1948	10.11	12.06
1955	17.71	18.70
1960	19.68	19.09
1965 [3]	21.65	20.05

[1] A comparison of cost data regarding medical services in industry is difficult, since items included in cost figures vary considerably from company to company. Also, costs vary considerably according to size of company and method of providing service. In the above tabulation, the figures reported for 1915, 1930, and 1940–41 were reported by Gaylord R. Hess in *Medical Service in Industry and Workmen's Compensation Laws.* They represent data compiled by the National Conference Board and the American College of Surgeons. The figures for 1948 and later years were reported by the National Industrial Conference Board as the result of periodic surveys in which 96 companies participated. The companies in 1955 and 1960 were identical and it is quite probable that they also represented those reporting in 1948. These 3 years are therefore more comparable than the earlier figures.

[2] Based on consumer price indexes for all commodity groups as reported in the *Statistical Abstract of the United States, 1964.*

[3] Based on an estimated comparable increase in costs between 1955–60 and 1960–65.

Source: U.S. Department of Health, Education, and Welfare, Public Health Service, Division of Occupational Health.

Table 16. Occupational health personnel in government agencies, and membership in the American Conference of Governmental Industrial Hygienists and the American Industrial Hygiene Association, specified years, 1938–64

Year	Personnel (professional and technical only)		Membership	
	State and local governmental units [1]	U.S. Public Health Service [2]	ACGIH	AIHA
1938	131	[3] 35	76	.....
1940	[3] 140	40	103	160
1945	207	[3] 95	250	253
1950	421	56	286	621
1955	370	44	305	946
1960	510	56	511	1,163
1961	584	69	564	1,196
1962	609	83	595	1,260
1963	615	91	655	1,324
1964	681	109	740	1,387

[1] Exclusive of Public Health Service personnel on loan.
[2] Includes personnel on loan to the States.
[3] Estimated.

Source: U.S. Department of Health, Education, and Welfare, Public Health Service, Division of Occupational Health.

Table 17. State and local governmental occupational health personnel, by functional-category, January 1965 [1]

Functional category	All jurisdictions	State		Local health departments
		Health departments	Labor departments	
States represented (including D.C. and Puerto Rico)	43	[2] 39	[2] 8	16
Jurisdictional units	86	40	8	38
Personnel, total	691	445	95	151
Physicians, total	46	29	9	8
Directors	19	13	1	5
Staff	19	10	7	2
Consultants	8	6	1	1
Nurse consultants, total	30	15	2	13
Employee health services, total [3]	37	35	.....	2
Physicians	10	9	.....	1
Nurse and technicians	27	26	.....	1
Engineers, industrial hygienists, total	265	158	45	62
Directors	35	22	4	9
Staff	230	136	41	53
Radiation staff, total [1]	96	79	10	7
Physicists, specialists	76	60	9	7
Technicians	20	19	1	.....
Air pollution staff, total [1]	28	26	.....	2
Specialists	24	22	.....	2
Technicians	4	4	.....	.....
Other staff, total	189	103	29	57
Chemists	120	84	22	14
Sanitarians	45	4	.....	41
X-ray technicians	5	5	.....	.....
All other	19	10	7	2

See footnotes on next page.

Table 18. Industrial Medical Association Membership, specified years, 1916–64

Year	Membership	Year	Membership
1916	150	1950	2,184
1930	315	1964	4,000
1940	1,023		

Source: Industrial Medical Association. Unpublished data.

Table 19. Number of physicians specializing in occupational medicine in the United States, specified years, 1949–62 [1]

Year	Number of physicians		
	Full time	Special part time	Total
1934	232	870	1,102
1936	269	990	1,259
1938	345	1,054	1,399
1940	404	1,204	1,608
1943	574	1,489	2,063
1949	947	1,107	2,054
1956	1,141	1,037	2,178
1958	1,247	1,072	2,319
1962	1,751	589	2,340

[1] The American Board of Preventive Medicine, which certifies in aviation medicine, occupational medicine, and public health was activated in 1948. Of the 1,704 full-time specialists in occupational health reported in mid-1961, there were 194 diplomates.

Source: Directory of the American Medical Association 1958 and previous years, also Paul Q. Peterson, M.D., and Maryland Y. Pennell. *Health Manpower Source Book (Section 14)*. Washington, U.S. Government Printing Office, 1962.

Footnotes for table 17.

[1] Based on 1965 Directory of Governmental Occupational Health Personnel. Figures include full- and part-time personnel. Excluded are administrative heads, other than occupational health under which the activity is carried on, and Public Health Service personnel on loan. Included are radiation, air pollution, and employee health services personnel when part of or associated with formal occupational health programs.

[2] Puerto Rico is counted as a State jurisdiction. Georgia is credited with 2 programs. Programs in both health and labor agencies in California, Ohio, and Puerto Rico. 9 States have no programs.

[3] Staff directly associated with health services provided by departments for their own and other government employee, where service is under occupational health unit's supervision.

Source: U.S. Department of Health, Education, and Welfare, Public Health Service, Division of Occupational Health.

Table 20. Number of registered nurses employed full time by industry in the United States and territories, specified years, 1948–64

Year	Number of nurses	Year	Number of nurses
1948	9,565	1952	11,096
1949	10,610	1957	16,223
1950	10,757	1962	17,000
1951	11,871	1964	18,700

Source: U.S. Department of Health, Education, and Welfare, Public Health Service, Division of Occupational Health.

Table 21. Payrolls covered by workmen's compensation programs, specified years, 1940–63

Year	Payrolls (in millions)		Percent of payrolls covered
	All civilian wages and salaries	Covered by workmen's compensation [1]	
1940	$49,255	$35,500	72.1
1950	141,368	113,500	80.3
1955	201,124	168,000	83.5
1960	261,414	215,000	82.2
1961	268,636	219,000	81.5
1962	286,310	234,000	81.7
1963	302,266	246,000	82.0

[1] Payrolls of employers insuring with private carriers, State funds, or self-insured, and pay covered by Federal programs in all areas.

Source: U.S. Department of Commerce, Bureau of the Census. *Statistical Abstract of the United States, 1964.* Washington, U.S. Government Printing Office, 1964.

Table 22. Workmen's compensation coverage, benefits, and costs, specified years, 1940–63

Calendar year	Ranges in estimated number of workers covered per month (in millions)	Benefit payments paid during the year			Percent of covered payroll	
		Total [2]	Medical and hospitalization	Compensation payments	Cost of [3] workmen's compensation	Benefits
		Millions of dollars				
1940	24.2–25.0	256	95	161	1.19	0.72
1946	32.2–33.2	434	140	294	.91	.54
1950	36.5–37.2	615	200	415	.89	.54
1955	41.2–41.6	916	325	591	.91	.55
1960 [1]	43.9–44.1	1,288	435	853	.95	.60
1961 [1]	43.8–44.0	1,362	460	902	.98	.62
1962 [1]	45.2–45.4	1,467	490	977	.99	.63
1963 [1]	46.0–46.2	1,561	520	1,041	1.00	.63

[1] Data include Alaska and Hawaii.
[2] Includes insurance losses paid by private carriers, State fund disbursements, and employers self-insurance payments.
[3] Premiums.

Source: U.S. Department of Health, Education, and Welfare. *Health, Education, and Welfare Trends*, 1963 edition, and *Social Security Bulletin*, January 1964 and 1965.

Table 23. Comparison State workmen's compensation legislation 1954–64

Selected item	Number of States [1]	
	1964	1954
Occupational disease coverage: [2]		
Full coverage	32	29
Scheduled coverage	19	20
No specific coverage	1	2
Medical benefits for occupational disease:		
Full benefits	31	28
Limited benefits	20	22
No specific coverage	1	2
Medical benefits for accidental injury:		
Full benefits	40	34
Limited benefits	12	18
Benefits for permanent total disability:		
For life or period of disability	30	23
Limited to specified period	22	19

[1] Includes District of Columbia and Puerto Rico. In addition, U.S. legislation provides full coverage for Federal employees and longshoremen.

[2] Full coverage designates laws that simply specify that all occupational diseases are included. Schedule coverage designates States where specific diseases are listed.

Source: U.S. Department of Labor, Bureau of Labor Standards. *State Workmen's Compensation Laws (Bulletin 212, revised 1964)* and earlier Department of Labor publications. Washington, U.S. Government Printing Office.

Table 24. Growth of primary insureds [1] protected by health insurance by type of protection, United States, 1952–62

Type of protection	Number of primary insureds (in thousands)		Percent increase 1952–62
	1962	1952	
Hospital expense	58,475	40,114	46
Surgical expense	52,406	31,856	65
Regular medical expense	39,417	17,279	128
Major medical expense	14,250	350	3,971

[1] As distinguished from dependents. Includes those enrolled in groups or as individuals in insurance company, Blue Cross-Blue Shield, and independent plans.

Source: Adapted from *Source Book of Health Insurance Data 1963.* New York, Health Insurance Institute. 1963.

Table 25. Estimated number and percent of wage and salary workers covered by employer benefit plans,[1] by specified type of benefit, specified years, 1954–63

Year	All wage and salary workers (public and private)				Workers in private industry
	Hospitalization	Surgical	Regular medical	Major medical	Temporary disability, including formal sick leave[2]
	Number of employees covered (in millions)				
1954	31.1	27.8	17.0	0.8	22.9
1956	35.6	33.2	22.7	3.6	24.7
1958	37.2	35.2	25.7	6.3	23.8
1960	40.4	38.7	30.0	9.7	24.5
1963	44.9	43.0	34.9	14.6	25.7
	Covered employees as percent of wage and salary workers[3]				
1954	58.7	52.5	32.1	1.5	50.0
1956	62.8	58.5	40.0	6.3	50.3
1958	66.5	62.9	46.0	11.2	49.7
1960	68.7	65.9	51.0	16.6	49.0
1963	73.1	70.0	56.8	23.8	49.5

[1] Plans whose benefits flow from the employee relationship and are not underwritten or paid directly by government (Federal, State, or local). Excludes workmen's compensation required by statute and employers' liability.

[2] Includes private plans written in compliance with State temporary disability laws in California, New Jersey, and New York.

[3] Percentages for temporary disability coverage based on wage and salary workers in private industry.

Source: Adapted from Kreslow, Joseph. Employee Benefit Plans, 1954–62. *Social Security Bulletin*, 27: 4–20 (April) 1965.

Table 26. Estimated hospital and medical benefits paid under employee benefit plans,[1] by type of benefit, specified years, 1954–63

Benefits for all wage and salary workers	Amount of benefits paid (in millions)				
	1954	1956	1958	1960	1963
Total:					
Current dollars [2]	$1,642.5	$2,320.3	$3,054.8	$3,898.2	$5,010.8
Constant dollars 1954=100 [3]	1,642.5	2,197.3	2,656.3	3,136.1	3,684.4
Hospitalization	1,079.9	1,495.4	1,892.7	2,355.0	3,259.5
Surgical and regular medical	552.6	757.9	929.1	1,116.2	1,443.7
Major medical	10.0	67.0	233.0	427.0	752.0

[1] Plans whose benefits flow from the employee relationship and are not underwritten or paid directly by government (Federal, State, or local). Excludes workmen's compensation required by statute and employers liability.

[2] Covers payments for coverage of employees and dependents.

[3] Based on consumer price indexes for medical care reported in *Statistical Abstract of the United States, 1964.*

Source: Adapted from Kreslow, Joseph. Employee Benefit Plans, 1954–62. *Social Security Bulletin,* 27: 4–20 (April) 1965.

Table 27. Estimated total employer and employee contributions [1] for hospital and medical care under employee benefit plans,[2] by type of benefit, specified years, 1954–63

Benefits for all wage and salary workers	1954	1956	1958	1960	1963
	Amount of contributions (in millions)				
Total:					
Current dollars [2]	$1,923.6	$2,594.7	$3,286.4	$4,247.0	$5,904.7
Constant dollars 1954=100 [3]	1,923-6	2,457.1	2,857.7	3,416.7	4,341.7
Hospitalization	1,221.4	1,603.2	1.944.9	2,504.8	3,415.6
Surgical and regular medical	684.2	897.5	1,075.5	1,272.2	1,652.1
Major medical	18.0	94.0	266.0	470.0	837.0
	Contributions as percent of all wages and salaries				
Total	1.04	1.19	1.44	1.63	1.96
Hospitalization	.66	.74	.85	.96	1.13
Surgical	.37	.41	.47	.49	.55
Regular and major medical	.01	.04	.12	.18	.28

[1] Plans whose benefits flow from the employee relationship and are not underwritten or paid directly by government (Federal, State, or local). Excludes workmen's compensation required by statute and employers liability.

[2] Covers contributions for coverage of employees and dependents.

[3] Based on consumer price indexes for medical care reported in *Statistical Abstract of the United States, 1964.*

Source: Adapted from Kreslow, Joseph. Employee Benefit Plans, 1954–62. *Social Security Bulletin,* 27: 4–20 (April) 1965.

Table 28. Extent of protection against income loss from nonoccupational short-term sickness [1] among wage and salary workers and the self-employed, specified years, 1948–63

Year	Amount of income loss (in millions)	Protection provided [2]	
		Amount (in millions)	As percent of loss
1948	$4,566	$757	16.6
1950	4,789	940	19.6
1952	5,814	1,302	22.4
1954	6,104	1,473	24.1
1956	7,056	1,798	25.5
1958	7,451	2,082	27.9
1960 [3]	8,580	2,418	28.2
1962 [3]	9,657	2,751	28.5
1963 [3]	10,213	2,977	29.1

[1] Short-term or temporary non-work-connected disability (lasting not more than 6 months) and the first 6 months of long-term disability.
[2] Includes both cash benefits and sick leave.
[3] Includes data for Alaska and Hawaii.

Source: Skolnick, Alfred M. Income-Loss Protection Against Short-Term Sickness, 1948–1963. *Social Security Bulletin*, 28: 30–37 (January) 1965.

Table 29. Estimated value of formal paid sick leave in private industry and in Federal, State, and local government employment, specified years, 1948–63

Year	Total workers	Workers in private industry			Government workers		
		Total	Not covered by temporary disability laws	Covered by temporary disability insurance laws [1]	Total	Federal	State and local
	Current value (millions of dollars)						
1948	$413	$157	$145	$12	$256	$148	$108
1950	493	178	154	24	315	172	143
1954	741	241	201	40	500	252	248
1958	1,032	336	281	55	696	315	381
1962 [2]	1,453	455	380	75	998	414	584
1963 [2]	1,618	506	424	82	1,112	450	662

	Constant dollars 1948=100 [3]						
1948	413	157	145	12	256	148	108
1950	493	178	154	24	315	172	143
1954	664	216	180	36	448	226	222
1958	860	280	234	46	580	262	317
1962 [2]	1,155	362	302	60	793	329	464
1963 [2]	1,270	397	332	64	875	353	520

[1] Assumes that some workers entitled to cash benefits under the laws have sick leave in addition to their benefits under the laws, but only to the extent needed to bring up to 80 percent the replacement of their potential loss.

[2] Includes Alaska and Hawaii.

[3] Based on purchasing power of the dollar at consumer prices.

Source: Based on Skolnik, Alfred M. Income-Loss Protection Against Short-Term Sickness, 1948–63. *Social Security Bulletin* 28: 30–37 (January) 1965.

Table 30. Premiums and benefit payments for private insurance against income loss, specified years, 1950–63 [1]
(Amounts in millions)

Year	Total	Under voluntary provisions				Under public provisions		
		Total	Group insurance [2]	Individual insurance [2]	Self-insurance [3]	Total	Group insurance [2]	Self-insurance [4]
	Premiums [5]							
1950	$685.3	$609.4	$225.6	$360.0	$23.8	$75.9	$58.3	$17.6
1955	1,133.9	955.1	386.2	547.8	21.1	178.8	128.3	50.5
1960	1,563.4	1,321.0	514.3	783.0	23.7	242.4	170.7	71.7
1963	1,697.7	1,449.3	554.6	871.4	23.3	248.4	165.0	83.4
	Benefit, payments							
1950	$383.8	$329.5	$161.3	$153.0	$15.2	$54.3	$41.7	$12.6
1955	692.4	557.2	292.0	250.0	15.2	135.2	97.0	38.2
1960	1,031.2	835.1	424.1	392.8	18.2	196.1	138.1	58.0
1963	1,115.3	919.3	455.3	446.5	17.5	196.0	130.2	65.8

[1] Beginning 1960, data include Alaska and Hawaii.

[2] Data on premiums earned and losses incurred by commercial companies (including fraternal) as provided by the Health Insurance Association of America for the United States, by types of insurance benefit, adjusted to include accidental death and dismemberment provisions in individual policies that insure against income loss to offset understatement arising from the omission of current short-term income-loss insurance in automobile, resident liability, life, and other policies. For 1956–63, dividends deducted from earned premiums (2–3 percent for group; 1 percent for individual). Starting with 1956, all credit accident and health insurance classified under individual insurance.

[3] Union-management trust fund, trade-union, and mutual benefit association plans.

[4] Company, union, and union-management plans under California, New Jersey, and New York laws.

[5] Loss ratios applicable to all group insurance were applied to the benefits under voluntary provisions and under public provisions to obtain the premiums applicable to each.

Source: Skolnik, A. M., and Mitchell, J. W. Income-Loss Protection Against Short-Term Sickness, 1948–63. *Social Security Bulletin*, 28: 30–37 (January) 1965.

Table 31. Insurance benefits as percent of estimated potentially insurable and compensable income loss [1] for workers without exclusive formal sick leave, specified years, 1950–63

(Amounts in millions)

Year	Amount of insurance benefits [2] (in millions)	As percent of—			
		Income loss excluding first 3 days [3]	Two-thirds of income loss excluding first 3 days	Income loss excluding first 7 days [4]	Two-thirds of income loss excluding first 7 days
1950	$447	15.4	23.1	19.6	29.3
1955	802	20.5	30.7	26.0	39.0
1960	1,203	24.0	36.0	30.6	45.8
1963	1,359	23.3	34.9	29.6	44.4

[1] The portion of income loss that may be considered insurable or compensable under prevailing insurance practices.

[2] Excludes sick-leave payments.

[3] Based on 70 percent of total income loss, after exclusion of income loss of workers covered by exclusive sick-leave plans. (Plans that do not supplement any other form of group protection.)

[4] Based on 55 percent of total income loss, after exclusion of income loss of workers covered by exclusive sick-leave plans.

Source: Skolnik, A. M., and Mitchell, J. W. Income-Loss Protection Against Short-Term Sickness, 1948–63. *Social Security Bulletin*, 28: 30–37 (January) 1965.

Table 32. Estimated number of persons aged 14–64 in the United States receiving cash payments for long-term total disability [1] from public income-maintenance programs, December of specified years, 1939–63

Source of cash payment	Number of persons (thousands)			
	1939	1949	1959	1963
Long-term disabled aged 14–64:				
Total number in population	2,300	2,700	3,100	3,300
Number receiving payments [2]	290	490	1,290	1,790
Federal civilian and uniformed services retirement	40	80	135	165
State and local government employee retirement	10	20	35	50
Workmen's compensation	45	60	75	75
Veterans' compensation and pension programs [3]	160	275	330	275
Railroad retirement	15	40	45	40
Old-age, survivors, and disability insurance:				
Worker disability	.....	.....	335	825
Childhood disability	.....	.....	80	165
Public assistance:				
Aid to the blind	40	50	55	60
Aid to the permanently and totally disabled	.....	.....	340	465
Percent of long-term disabled receiving payments	12.6	18.1	41.6	54.2

[1] Physical or mental disease or impairments that for more than 6 months have prevented persons from working or following their normal activities on a regular basis.

[2] Because some persons received payments from more than one source, the sum of the recipients under the individual programs is larger than the total.

[3] Payments to veterans reported as having disability ratings of 70 percent or more.

Source: Skolnik, Alfred M. Notes and Brief Reports, *Social Security Bulletin*, 27: 24–25 (October) 1964.

Table 33. Old-Age, Survivors, and Disability Insurance Program: Number of disabled workers and their dependents with benefits in current payment status at end of period and total monthly benefit amount, specified years, 1957–64

Period [1]	Number of beneficiaries			Monthly benefit amount millions	
	Total	Disabled workers [2]	Dependents	Current prices	Constant dollars [3]
	In thousands				
1957	150	150	.....	$10.9	11.1
1958	268	238	30	20.4	20.3
1959	460	334	126	33.9	33.4
1960	687	455	232	48.0	46.6
1961	1,027	618	409	67.8	65.1
1962	1,275	741	534	82.5	78.3
1963	1,452	827	625	93.3	87.4
1964	1,569	893	676	101.3	93.2

[1] The Federal Disability-Insurance Trust Fund was created by the Social Security Amendments of 1956. Contributions became payable starting in 1957 and benefit disbursements were first made in August for July 1957. Disability benefits are payable only after a 6-month waiting period and are calculated as if the worker were of retirement age. Workers must have worked in covered employment at least 5 years out of the 10 immediately before the beginning of his disability and must be fully insured. Data relate to the month of December for all years except 1964 where they are for November.

[2] Disabled workers under 65. Prior to November 1960, disability benefits were limited to disabled workers aged 50–64.

[3] Based on consumer purchasing power of the dollar 1957–59=100.

Source: Adapted from *Health, Education, and Welfare Indicators, January 1964 and 1965.* Washington, U.S. Department of Health, Education, and Welfare.

Table 34. Persons rehabilitated under Federal-State-financed vocational rehabilitation programs, specified years, 1935–63 [1]

Fiscal year	Both sexes	Persons rehabilitated [2]				Number of persons rehabilitated per 100,000 persons in civilian population	Average cost per rehabilitant	
		Males		Females			Current dollars	Constant dollars [3]
		Number	Percent	Number	Percent			
1935	9,422	7,493	79.9	1,885	20.1	7	.....	.....
1940	11,890	8,821	74.2	3,065	25.8	9	.....	.....
1945	41,925	34,465	82.2	7,450	17.8	32	235	147
1950	59,597	39,918	67.0	19,667	33.0	39	492	412
1955	57,981	36,671	63.2	21,310	36.8	35	677	632
1963	110,136	67,656	61.4	42,463	38.6	58	1,063	1,134

[1] Since 1920 the Federal Government has made grants to assist States in maintaining basic vocational rehabilitation services which make it possible for disabled persons to prepare for and engage in remunerative employment. In 1943 the program was broadened to include services to the mentally as well as the physically handicapped and to provide physical restoration as well as training. In 1954 the Vocational Rehabilitation Act was amended by adding provisions for establishing rehabilitation facilities and workshops, and State-agency-managed business enterprises for the severely disabled.

[2] Median age of acceptance for rehabilitation ranged from 28 in 1945 to 35 in 1963. Comparable data for 1935 and 1940 were not available.

[3] Consumer price indexes 1957–59=100.

Source: *Health, Education, and Welfare Trends, 1964 ed.* Washington, U.S. Department of Health, Education, and Welfare, 1964.

Table 35. Vocational Rehabilitation rehabilitants, by type of disability: United States, fiscal year, 1963

Type of disability	Persons rehabilitated
Total	[1] 110,136
Orthopedic [2]	40,504
Visual	11,416
Hearing	6,767
Cardiac	5,138
Pulmonary tuberculosis	5,188
Mental retardation	5,909
Mental illness [3]	7,827
Epilepsy	2,211
All others	25,119

[1] Total is slightly larger than the sum of the various groups because the type of disability was not always reported.
[2] Amputations or impairments of limbs, back, head, or chest from any cause.
[3] Psychosis and psychoneurosis.

Source: *Health, Education, and Welfare Trends, 1964 ed.* Washington, U.S. Department of Health, Education, and Welfare.

Table 36. Health and medical care: Private expenditures and expenditures under public programs, United States, specified fiscal years, 1934–35 through 1963–64

(In millions)

Type of expenditure	1934–35	1944–45	1954–55	1960–61	1963–64 [1]
Total	$3,138.5	$7,906.0	$17,875.2	$28,898.2	$35,400.6
Private expenditures	2,580.0	5,335.0	13,517.0	21,835.0	26,367.0
Health and medical services	2,570.0	5,305.0	13,192.0	21,234.0	25,355.0
Direct payments	[2] 2,500.0	[2] 4,875.0	9,448.0	13,942.0	15,617.0
Insurance benefits	.....	.....	2,358.0	5,346.0	7,471.1
Expense for prepayment	.....	.....	596.0	912.0	1,147.0
Industrial in-plant services	30.0	90.0	210.0	275.0	302.0
Philanthropy	40.0	340.0	580.0	759.0	818.0
Medical facilities construction	10.0	30.0	325.0	601.0	1,012.0

Public expenditures	558.5	2,571.0	4,358.2	7,063.2	9,033.8
Health and medical services	517.3	2,504.8	3,947.7	6,481.6	8,316.1
Workmen's compensation medical benefits [3]	65.0	122.0	315.0	450.0	540.0
Temporary disability insurance (medical benefits) [4]	.....	.....	6.0	19.6	30.0
Medical vocational rehabilitation	.....	1.4	9.2	20.4	32.0
Other public health activities	452.3	2,381.4	3,617.5	5,991.6	7,714.1
Medical facilities construction	41.2	66.2	410.5	581.6	717.5
Total expenditures as percent of gross national product	4.6	3.7	4.7	5.7	5.9
Public expenditures as percent of total expenditure	17.8	32.5	24.4	24.4	25.5

[1] Preliminary estimate.

[2] Includes any insurance benefits and expenses for prepayment (insurance premiums less insurance benefits).

[3] Includes medical benefits paid under public law by private insurance carriers and self-insurers.

[4] Excludes medical benefits paid under public law in California and New York by private-insured and self-insured plans; such benefits included in insurance benefits under private expenditures.

Source: Merriam, Ida. Social Welfare Expenditures, 1963–64. *Social Security Bulletin*, 27: 3–14 (October) 1964.

Appendix

The American Conference of Governmental Industrial Hygienists

The Conference is an organization devoted to the development of administrative and technical aspects of worker health protection. Its membership is limited to professional personnel in government agencies engaged in occupational health activities. Representation of foreign countries gives the organization an international scope.

The program was organized in 1938; membership has increased from 74 persons in that year to 740 in 1964. The objectives of the Conference are to—

1. Promote industrial hygiene in all its aspects and phases.
2. Coordinate industrial hygiene activities in all their aspects and phases of official Federal, State, and local and territorial industrial hygiene agencies.
3. Encourage the interchange of experience among industrial hygiene personnel in such official organizations.
4. Collect and make accessible to all governmental industrial hygienists such information and data as may be of assistance to them in the proper fulfillment of their duties.
5. Hold annual and such other meetings as may be necessary to effectuate the purpose of this organization.

Source: American Conference of Governmental Industrial Hygienists Register, 1964.

The American Industrial Hygiene Association

The American Industrial Hygiene Association was organized in 1939. It had 160 members in early 1940. By 1964 membership had reached approximately 1,400, including a limited number of members in Canada and other countries.

Its regular members are people engaged in industrial hygiene for at least 3 years who have been graduated from college or have had equivalent training. The objectives of the program are—

1. To increase the knowledge of industrial hygiene through interchange and dissemination of information.
2. To promote the study and control of environmental factors affecting the health and well-being of industrial workers.
3. To correlate such activities as are conducted by individuals and agencies throughout industrial, educational, and governmental groups.
4. To bring together persons interested in various phases of industrial hygiene. The association sponsors several publications

and meets annually. Through technical committees it conducts activities relating to such subjects as air pollution, analytical chemistry, biochemistry assays, engineering, etc.

Source: *SBS Counselor* (January–February) 1963.

The American Medical Association, Council on Occupational Health

The American Medical Association, Council on Industrial Health (now Council on Occupational Health), held its first meeting in 1946. Soon after it was organized, members of the council took part in the formation of the International Health Organization which later became the World Health Organization, and members also participated in conferences with the International Labor Organization. The council also helped to sponsor the American Academy of Occupational Medicine in 1946.

Since then the council has engaged in many activities and has issued numerous publications in the field of occupational health.

The council, which is composed of approximately nine prominent industrial physicians, conducts its activities through an executive secretary and members of subcommittees.

Source: *History of the Council on Industrial Health (processed)* and unpublished data.

Industrial Medical Association

The Industrial Medical Association was organized in 1915 as the American Association of Industrial Physicians & Surgeons. The object of this association is to foster the study of the problems peculiar to the practice of industrial medicine and surgery, and to unite into one organization members of the medical profession whose interests lie in that field. It encourages the development of methods adapted to the conservation and improvement of health among workers, and promotes a more general understanding of the purposes and results of the medical care of these workers.

The membership has grown from 150 members in 1916 to approximately 4,000 physicians in 1965. Physicians who have an interest in industrial medicine may apply for membership; specialization in this field is not essential. Regionally, the Industrial Medical Association has 28 component societies in the United States. The majority of the association's members carry their membership through one of the component societies. The association issues the *Journal of Occupational Medicine* monthly and holds an annual meeting.

The Occupational Health Institute is a nonprofit educational organization created by the Industrial Medical Association to promote the cause of health in industry. Since 1951, the Occupational Health Institute has conducted the program of evaluation, approval, and certification of medical services in industry, on the basis of the standards approved by the Standards Committee of the Industrial Medical Association. This activity was formerly conducted by the American College of Surgeons.

Source: *Journal of Occupational Medicine*, 7: 6a (March) 1965.

Nursing Organizations

Reports indicate that in 1964, there were 18,700 nurses employed full time by industries in the United States and territories.

In her publication, *Occupational Health Nursing*, Mary Louise Brown states that there are three national organizations which the occupational health nurse may join. These are the American Nurses' Association (ANA), the National League for Nursing (NLN), and the American Association for Industrial Nurses (AAIN). In addition to these, the nurses may join the National Safety Council's Occupational Health Nursing section, and the American Public Health Association's Occupational Health or Public Health Nursing section. Each of these two organizations have programs serving occupational health interests.

The ANA was organized in 1886. All members are professional registered nurses, representing every field of nursing. Occupational health nurses belong to the Industrial Nurse section. The objective of this section is to foster high standards of industrial nursing practice, to promote the welfare of industrial nurses, and to provide an opportunity for the consideration of problems of special interest to industrial nurses.

The NLN was formed in 1952. In this organization, nurses and friends of nursing act together to provide the people of their communities with the best possible nursing service, and to assure good nursing education.

The AAIN was organized in 1942. Its members are professional nurses who are employed full time in commerce or industry, or in conserving, protecting, or restoring the health and safety of employed workers; they are also the nurse consultants and nurse educators who devote full time to the field of industrial nursing.

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